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HEAVY-DUTY CIRCULAR SAWS ■ INSTALL COUNTERTOPS LIKE A PRO

# WORKBENCH<sup>®</sup>

THE ORIGINAL HOME WOODWORKING AND IMPROVEMENT MAGAZINE

## Build A Tool Storage Shed

Shop Project:  
Benchtop Planer  
Station

Step-by-Step  
Gardener's Work  
Center Plans

June 1998/\$3.95  
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Display until July 13, 1998



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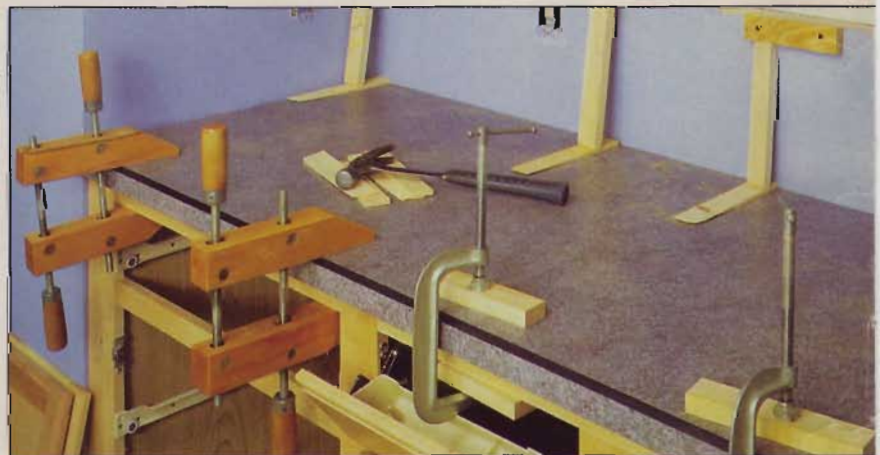
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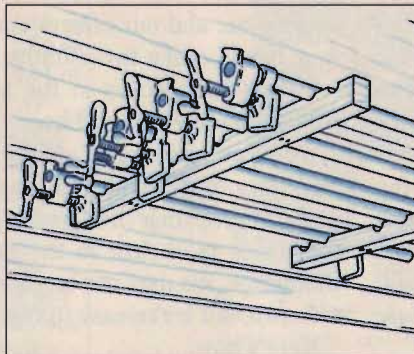
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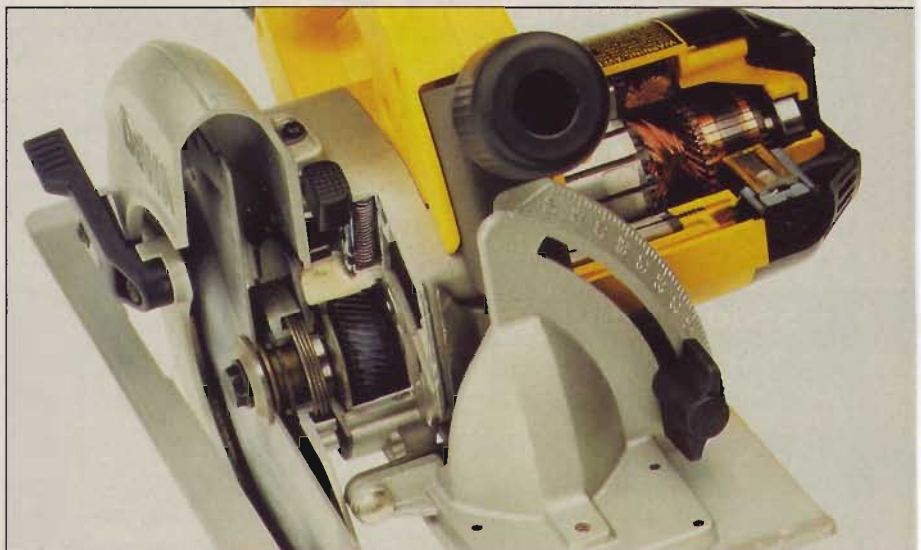
Favoring a sidewinder or worm-drive circular saw may be the result of geographic destiny.



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# Reaching Us

When we develop the projects for *Workbench*, the process usually takes a long time. First somebody has an idea, often growing out of a problem or solution they experienced working in their own home or shop. Then we all talk it over, make some sketches, take the idea in various directions, and eventually end up with a rough notion of what we want. Designers hone the idea still further, until we all agree it's ready and sawdust starts to fly.

The point is, I have a lot of resources to draw on, and our efforts end up in your hands every two months. I wish everyone had access to the talented craftsmen I have around here.

Well, you may not be able to talk to them face to face, but I do know how you can get their help, especially if something is unclear in the pages of *Workbench*. We may not be right there with you, but we're easy to reach.

Here's how . . .

## Woodworking and Home Improvement Questions

Matt TeRonde is our technical support expert. If you call (800) 311-3991 you can talk to Matt about woodworking problems, and get help on tough spots in the projects. Matt has heard it all, so don't ever think your question is too small to give him a holler. And if he doesn't have the answer right off, he'll talk to us and we'll work together to get you what you need. You can also write to Matt or to us at *Workbench*, 2200 Grand Ave., Des Moines, IA 50312. Be sure to send your Tips to this address too.

## Send us an E-mail

If you're up to speed on the internet you can send a tip, message, or question to [workbench@workbenchmag.com](mailto:workbench@workbenchmag.com) and it will come right to our office.

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Logging onto the *Workbench* web site at [www.workbenchmag.com](http://www.workbenchmag.com) will put you in touch with a lot of good information as well as connect you with our forums on woodworking and home improvement. You'll find out about our other fine magazines, books and products, job openings, and links to dozens of web sites in the woodworking and home improvement field.

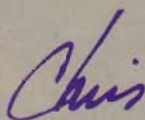
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You may need to tell us about a concern or problem with your magazine. The easiest way to let us know your needs is by calling (800) 311-3991.

## Ordering Project Supplies

In addition to the internet addresses above, you can order hardware kits for projects by calling (800) 311-3994

## Happy Father's Day!



**Safety Reminder:** Woodworking and home improvement are rewarding hobbies. But there is risk of injury. Use the guards and read the manuals that come with your tools and equipment. And if you're uncertain about a technique, find an alternative with which you are more comfortable. Please take safety seriously.

# WORKBENCH

VOLUME 54

NUMBER 3

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<http://www.augusthome.com>



Audit Bureau  
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WORKBENCH (ISSN 0043-8057) is published bimonthly (Jan., Mar., May, July, Sept., Nov.) by August Home Publishing Company, 2200 Grand Ave., Des Moines, Iowa, 50312.

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**Subscription rates:** Single copy, \$3.95. One year subscription (6 issues), \$15.95. Canadian/Foreign, add \$6.00 per year. Periodicals postage paid at Des Moines, IA and at additional offices.

"USPS/Heartland Press Automatable Poly."

**Postmaster:** Send address changes to *Workbench*, PO Box 37272, Boone, IA 50037-0272.

Printed in U.S.A.



# Questions & Answers

## Panels Provide Access For Reattaching Window Weights

**Q** *The ropes that are supposed to hold my window weights are broken. How can I get to the weights so I can fix them?*

*Bob Anderson  
Montauk, RI*

**A** Repairing sash cords is simple, but getting at them takes a bit of work. The cords are attached to the edges of the sash and to weights that ride in a cavity behind the window's side jambs. A pulley near the top of the jamb guides the cord. The weight counterbalances the sash, making it easier to raise and lower.

On most windows, you can get to the weights through access panels located on the side jambs. To reach the panels, you first have to remove the sash and the stops that hold the sash in place.

Use a utility knife if necessary to cut through the paint or finish where the inner stops meet the jambs, and carefully pry the stops free. Remove the lower sash from the jamb. (Remove the parting stops as well if you plan to replace the cords for the upper sash).

Now you can get to the access panels. Remove the screw holding each panel, pull the panels out, and remove the weights nearest the inside wall (for the lower sash) from behind the jambs.

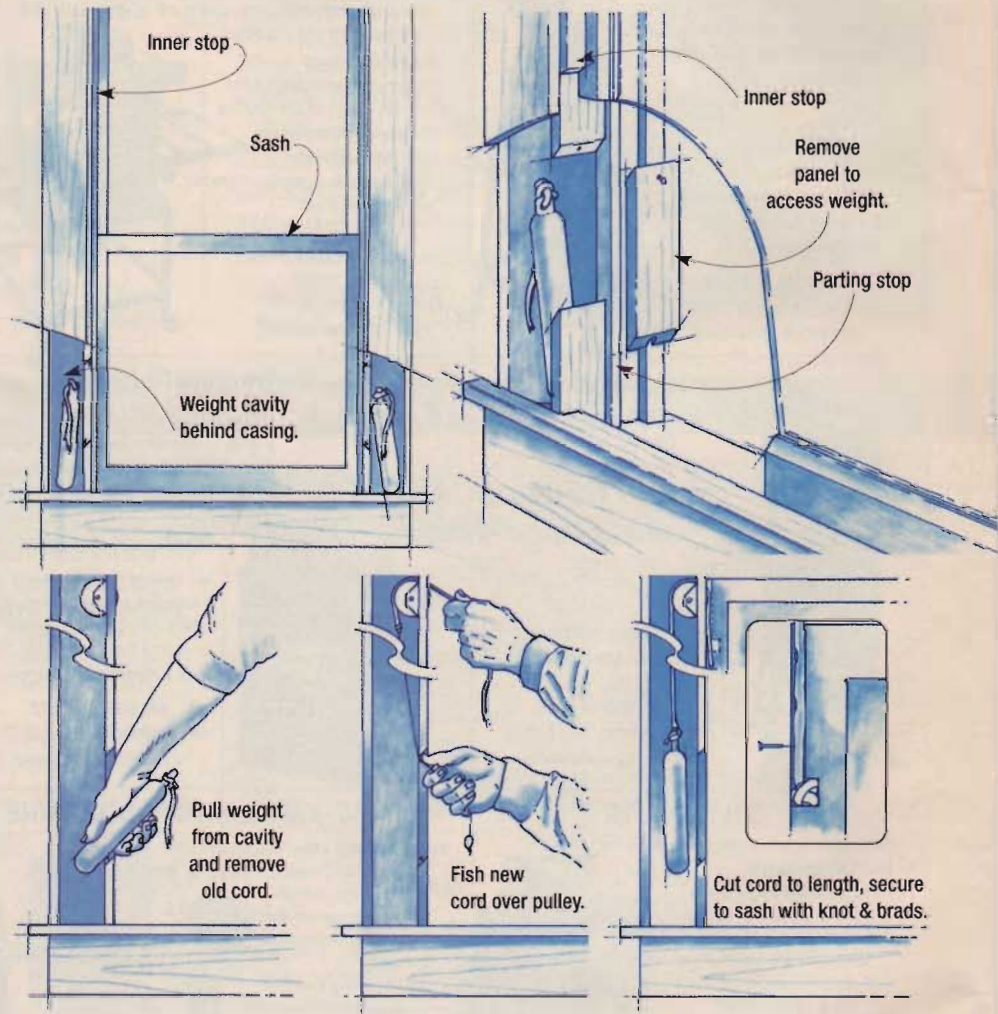
If any of the old cord remains, use it to size new sash cord, which you can pick up at a hardware store. Then feed the new sash cord over the pulley into the cavity. The cord can be tough to push through, so attach a fishing

weight to a string and drop it in first. Then tie the cord to the string and pull it through. Tie the cord to the weight and replace the weight in the cavity.

To determine the cords' length, hold the sash at its fully raised position. Pull the cord to raise the weight off the bot-

tom of the cavity, and cut the cord just below where it attaches to the sash. Tie a knot in the end of the cord, insert the knot in the edge of the sash, and drive brads through the cord into the sash.

Repeat this process for the other side then reinstall the sash and inner stops.



## SHARE YOUR QUESTIONS

If you have a question about woodworking or home improvement, write it down and mail it to WORKBENCH Q&A, 2200 Grand Ave., Des Moines, IA 50312. Please include your name, address and daytime phone number in case we have any questions for you. If you like, Fax us at (515) 283-2003 or send an E-mail message to [workbench@workbenchmag.com](mailto:workbench@workbenchmag.com).

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## Adjust Bandsaw Fence to Compensate for Blade Drift

**Q** *When I resaw on my band saw, the blade binds and cuts unevenly. The blade guides and tension are correct, and the fence is parallel with the miter gauge slot, so what's the problem?*

*John Yost  
Louisville, KY*

**A** Even when set up correctly, most band saws have some blade drift — a tendency to cut more aggressively to one side of the blade. Because of drift, your blade won't cut parallel to the fence, even when the fence is parallel to the miter gauge slot.

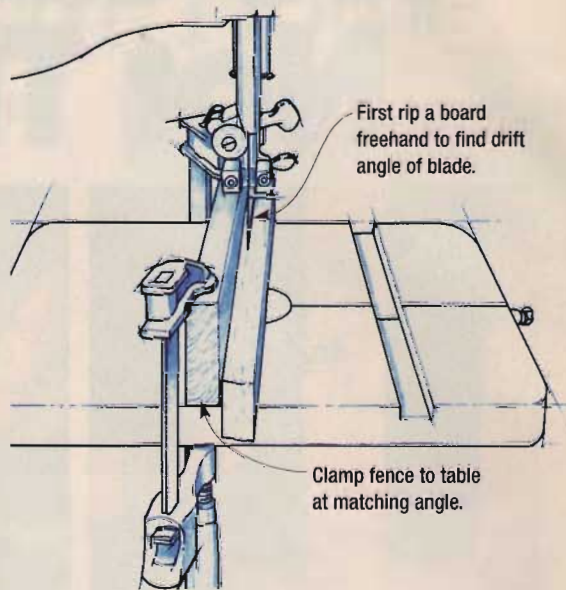
Causes of drift can be hard to track down, but contributing factors may be the saw's manufacturing tolerances, inconsistent blade tooth set, or uneven tooth sharpness. Wood hardness and feed rate can also have an effect.

If your saw is set up correctly and you still get blade drift, the simplest

solution is to compensate for it by angling your fence to match the drift.

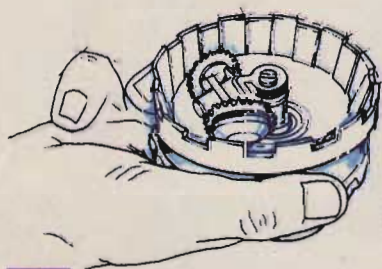
To find this angle, draw a straight line on a scrap board, parallel to the edge. With the fence out of the way, feed the board freehand and cut along the line. Adjust your infeed angle until the blade follows the line and offers the least resistance. Stop the cut midway through the board, then hold the workpiece in that position and shut off the saw. You'll probably find the board's edge isn't parallel with the miter gauge slot. If your fence has an angle adjustment, move it against the board and lock it in place at that angle.

If you can't adjust the angle of your fence, clamp a board to the table in its place, canted to the required angle.



Be aware that different blades may drift to a greater or lesser degree, so double-check your fence angle when you change blades.

## Removing Painted Wallpaper



Teeth cut through paint and wallpaper, but won't damage wallboard.



**Q** *The former owners of our house painted over wallpaper in one bedroom. How do I remove it with a minimum of aggravation?*

*S. Joseph  
Nashville, TN*

**A** If you are extraordinarily lucky, you'll have strippable paper correctly adhered to a properly primed wall. In that case, you simply work a corner of the paper loose, then pull it off the wall. If you have plaster walls, you can scrape off the wallpaper with a sharpened, stiff-bladed broad knife.

But a scraper can wreak havoc on wallboard, so in this instance the paper will require soaking or steaming before

it will budge. Your problem is that the paint will block penetration of the moisture needed to loosen the paper.

One solution I've found is a clever gadget from Zinsser called the Paper Tiger. This tool has teeth that penetrate the paint and wallpaper without damaging the walls. As you work the tool on your walls, the teeth create thousands of tiny holes that allow the moisture to get behind the paper, making it easier to remove. (For more information on the Paper Tiger, call Zinsser at (732) 469-4367.)

To loosen the paper's adhesive, you can use a chemical wallpaper remover or a steamer. Then gently scrape away the paper with a wide-blade knife.

## Child-Safe Finish

**Q** *I'm building a cradle, and I'm not sure what finish to use. What can you recommend that isn't toxic?*

*Paul Marotto  
Islip Terrace, NY*

**A** The simplest answer is to use a finish that's specifically stated to be "nontoxic." But that answer is a bit misleading, implying that if the finish isn't so marked that it will be toxic. In fact, most of the finishes available today are nontoxic once they are completely cured.

Until it's cured, any solvent-based finish may potentially be toxic. As the finish cures, though, most or all of the solvents evaporate.

Lead, formerly used as a hardener in finishes and paints, is now banned, so new finishes don't pose that threat.

You should be safe with most any varnish, polyurethane, or oil-based finish, or with one that's water-based. But for peace of mind check the label, then give the finish two to four weeks to cure before using the cradle.



## Bent Hinge Pin Keeps Doors from Swinging

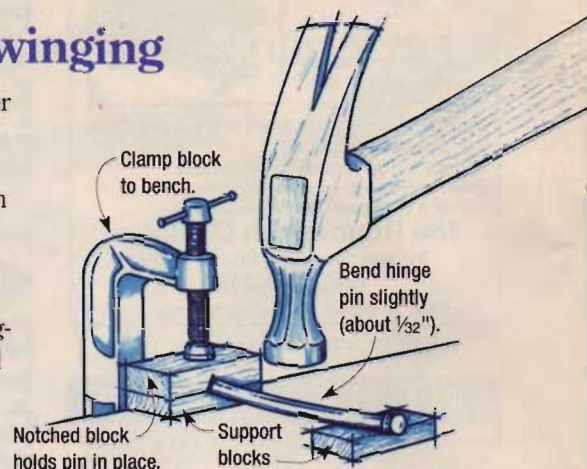
**Q** *A bedroom door in my home wants to swing closed on its own. Short of using a doorstop, what can I do to keep the door open?*

*S. Fountain  
Roanoke, VA*

**A** Curing a self-closing door is a simple matter. Begin by closing and latching the door, and removing one hinge pin. Support the pin between two blocks of scrap wood

and clamp another piece of scrap over one end to hold it in place. Strike the pin with a hammer, hitting it hard enough to put a slight bend in the pin (about  $1/32$ ").

Drive the bent pin in place and it should put enough tension on the hinge to prevent the door from swinging closed on its own. If the door still swings, repeat the bending process on another hinge pin. You may also need to bend the pin a little more.



## Kerosene Puts a New Spin on Dirty Guide Bearings

**Q** *Several of my router bits have guide bearings that don't turn freely anymore. I keep them wiped off, but they catch every so often and leave a burn mark on the work piece. Is there anything I can do to loosen them up or am I looking at buying new bearings?*

*Dave Warnick  
Kirkland, WA*

**A** Most guide bearings are a shielded type. Unlike higher-priced sealed bearings, shielded bearings have a phenolic cover that protects the bearings, but can let in fine dust. Try soaking the bearings in kerosene to flush out accumulated dust grime, but don't soak them for too long or you could remove too

much of the grease. Wipe the bearings with a clean cloth and let them dry thoroughly. Apply a bearing lubricant, such as Bostik brand, before you reinstall the bearings on the bits. If they still catch, replace them. Replacement bearings in a variety of sizes are available from most router bit manufacturers for about \$5 to \$15.

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**Make safety a habit!**  
Always wear safety goggles when using striking tools.



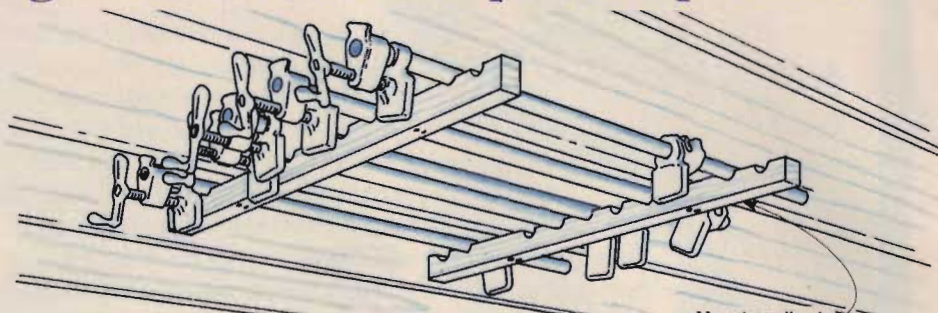
# Tips & Techniques

## Improve Shop Storage with Overhead Pipe Clamp Holder

In my small basement workshop, I never have enough storage room. I've gotten good at finding pockets of usable space everywhere I can, but I've never had a good solution for storing long pipe clamps. I just leaned them in a corner of the room, and more often than not when I needed a clamp it was at the back of the stack.

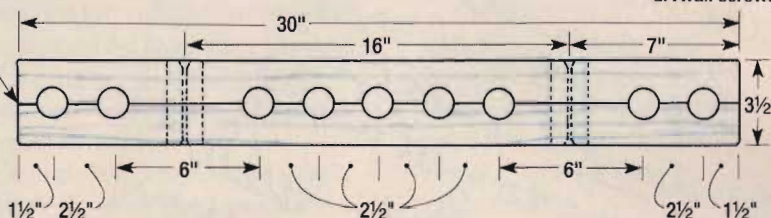
Because I have cabinets and shelves filling every wall, there's no room for a wall-mounted rack. So I designed a simple two-part clamp cradle that mounts to the last open spot in my shop — the ceiling. The cradle tucks the clamps into the unused space between the joists. With each cradle, I can keep up to nine clamps stored conveniently out of the way.

I started by drilling a series of holes centered along a 30"-long 2x4 (the spacing is shown at right). Then I ripped the board in half to yield two cradle halves with semi-circular notches for the clamps to rest in.



Drill 1 1/4"-dia. holes centered in 2x4, then rip board into two equal halves. Designed for floor joists spaced 16" on center.

Mount cradles to underside of joists using 3"-long drvwall screws.

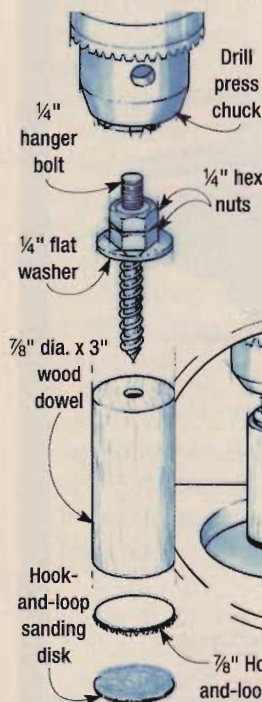


I drilled two pilot holes into the cradles where they crossed the joists and drove in 3"-long screws. Most of my clamps are 48" long, so I mounted the cradles 36" apart. You can vary

the spacing between the cradles if you need to hold clamps of different lengths.

*Phillip Benson  
Oklahoma City, OK*

## Mini Disk Sander for Drill Press



I occasionally build toys, Christmas ornaments, and small gift boxes that have deep recesses drilled in them. Most drill bits leave the hole bottoms pretty rough, but I figured out a way to sand them on my drill press.

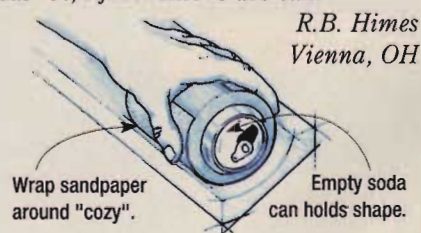
I cut a 3" length of 7/8"-dia. dowel and drilled a pilot hole in the center of one end. Then I ran nuts onto the machine-thread of a 1/4" hanger bolt, added a flat washer, and screwed the wood-threaded end into the dowel.

Glue a hook-and-loop pad to the end of the dowel, put a sanding disk on it, and chuck the hanger bolt in the drill press. Keep the sanding pressure moderate so you can move the workpiece around underneath.

*Jay Geisel  
LaConner, WA*

## Cozy Sanding Pad

They're designed to keep canned beer and soda cold, but those foam insulating holders (called "cozys") work great for sanding concave wood surfaces. I used one (with an empty can installed) to sand some cove molding I made in my shop. For tighter curves, I just remove the can.

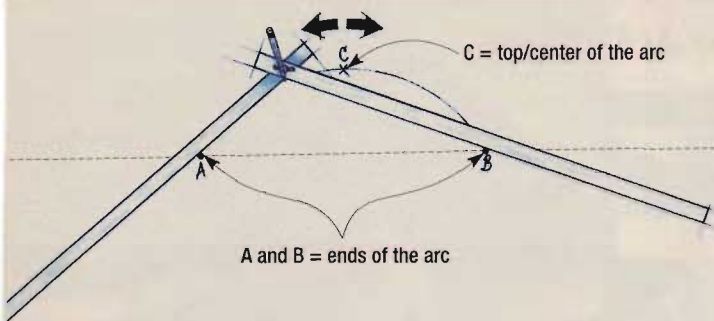


*R.B. Himes  
Vienna, OH*

## SHARE YOUR TIPS, JIGS, AND IDEAS

If you have a unique way of doing something, we'd like to hear from you. Just write down your tip and mail it to WORKBENCH Tips and Techniques, 2200 Grand Ave., Des Moines, IA 50312. Please include your name, address and daytime phone number in case we need to reach you. If you like, Fax us at (515) 283-2003, or e-mail us at [workbench@workbenchmag.com](mailto:workbench@workbenchmag.com) on the Internet. We'll pay you \$50-\$150 if we publish your tip.





## Alternate Arch Trammel

A few issues back you showed how to draw arcs using a slat bent with string. I remember a technique I was taught as a carpenter — using a framing square to draw a circle. The same technique works for arcs, using a shop-built trammel.

Start with a pair of thin (about 1/4") wood slats, and drill a 1/4" hole near one end of each. Countersink one of the holes, insert a flat-head 1/4"-20 machine screw through it, and set the other slat over the first. Cinch the two together with a washer and wing nut.

On your workpiece, drive two small finish nails on a line (A-B) to establish the ends of the arc. Then mark the top/center of the arc (C), and adjust the trammel "knuckle" so its inside corner rests over this point while the legs touch the nails at the arc ends.

Crank the wing nut tight, then nest a pencil in the trammel's inside corner and carefully work the assembly from side to side, keeping the trammel in contact with both nails (A, B) as you move. The slat length will vary with the height and width of the arc, so for a safe margin I add these two dimensions together, and cut to that length.

*Orville Vittitow  
Dayton, OH*

## Save Your Back

I've got a candidate for a great shop tool. Recently, I acquired an old rolling office stool (the backless kind) secondhand from a local medical clinic. It has one of those beefy threaded posts for adjusting the seat height, and I figured I could use the screw mechanism to make a bench vise.

Before I had a chance to take it apart, however, I got in the habit of using the stool around the shop. I used to spend a lot of time standing with my back bent over the work, maybe doing routing, sanding, or hand-carving. At the end of the day, I'd feel the strain in my lower back. Now I'm able to do a lot of that stuff sitting down. The wheeled base on the stool makes me instantly mobile, the seat swivels 360°, and I can adjust the height to keep my back comfortable while I work.

*John Robinson  
St. Louis, MO*

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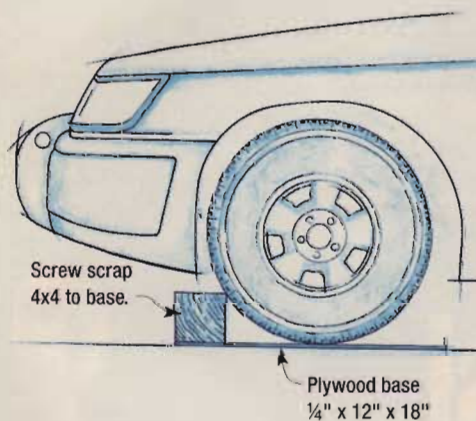
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## Wheel Chocks Prevent Mishaps

Like a lot of home-shop woodworkers, I have a shop that must double as a garage. Fortunately, it's just large enough to hold all of my woodworking tools and two cars. But in order to get the cars in, I had to mount my machines on mobile bases so I can push them against the back wall for storage, and space is still tight.

After I pulled in once and accidentally nudged my table saw with the car's front bumper, I decided to make simple wheel chocks for each car.



I made the parking chocks from scrap material — a 1/4"-thick plywood base 12"-wide x 18"-long, with a 12"-long piece of 4x4 screwed flush with one end. To keep the parking chocks from moving around, I attached non-skid tape to the bottom. I drilled a hole near one end of the plywood so I can hang the chocks on the wall when I have the machines out. After I figured out how far we could pull the cars into the garage, I painted marks on the floor to position a chock under the left front wheel of each car. Now there's no guesswork involved when the shop becomes a garage again.

When either of us pulls a car in, its left front tire runs onto the plywood and against the 4x4, stopping the car from rolling any farther forward.

*Joe Olsen  
Rockwell City, TX*

## Avoid Losing Your Drill Press Key

I'm forever setting down small items, like my drill press chuck key, then losing them because they blend into the mess. I'd swear that I spend more time looking for that key than I do using the drill press.

One day, when I got to cleaning up the chaos, I found a piece of windshield washer hose. I slid it onto one end of the key's handle, and stapled the other end of the hose to the wall behind the drill press. Now the key is always where I need it.

*P. Anderson  
Helena, MT*

## UNFINISHED TO FINISHED IN HALF THE TIME



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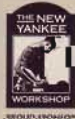
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Product Information Number 191

Workbench ■ June 1998



# News and Events

## Woods of Hawaii Show Highlights

Woods of Hawaii is a show that gives the islands' woodworkers a chance to display their craftsmanship, while at the same time serving higher goals — increasing awareness of the state's forest industry, and promoting conservancy of Hawaii's native wood species. Sponsored by the Hawaii Forest Industry Association, the sixth annual show was held in September of 1997, and attracted 58 woodworkers whose 132 entries vied for top honors.

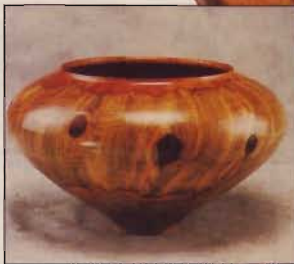
Entries were judged in seven categories including sculpture, musical instruments, and furniture. To help conserve native woods and increase public knowledge of lesser-known species, rules allowed projects to contain no more than 10% of four popular native woods; koa, kamani, milo, and ohia. These woods have been used for generations by native Hawaiians and, like all woods, they carry great cultural significance. In recent times, though, they've become threatened.

Show organizers encouraged using lesser-known Hawaiian species and

species introduced to the islands. Many projects were built with woods we mainlanders might never dream of, such as avocado, mango, and eucalyptus. Other even more obscure woods were used in projects as well.

Judging by the entries I saw, competition was tough, and those who won were deserving of their honors.

Best of Show and People's Choice honors for 1997 went to John Gonczar for his beautiful round table made of pheasantwood and eucalyptus, with striking koa veneer. A bowl turned from Norfolk Island pine brought Patrick Kramer first place in Turning. And in Architecture, the award went to Matthew D'Avella's chest crafted from mango, koa, and Queensland maple.



## Into the Past — 40 Years Ago in *Workbench*

It's been said that experience is the best teacher. At *Workbench* we've taken that to heart as we've worked to make a great magazine even better. We've spent a lot of time poring through 40 years worth of issues to see how the interests of do-it-yourselfers have evolved. It's been fun looking back, and we thought you'd enjoy it too.

This time, we've set our sights on June of 1958, when an individual copy cost 35 cents, and a six-issue subscription was \$2.

One practical project offered was a plywood gardener's bench that knocked down for easy transport to the garden.

Another article detailed a sure-fire method for repairing drywall using tin foil. A piece on electrical safety included a photo of a young woman tuning a radio from the bathtub — shocking indeed!



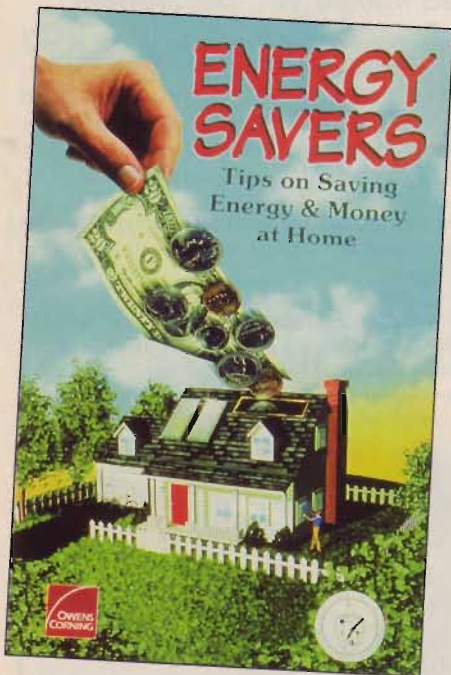
Patching holes in a fairly new material called "sheet rock" was easier if you first filled the gap with tin foil. Gardening was made easier with a portable plywood bench, while a racy photo brought readers' attention to electrical safety.



## Simple Tips Save Energy, Money

According to the United States Department of Energy (DOE), many of us could cut our energy costs by 10 to 50 percent by making just a few energy-wise home improvements.

While homeowners know they could decrease their home's energy consumption, many aren't sure what projects would be most beneficial. To help them decide, the DOE teamed with Owens Corning, establishing the Energy Savers Partnership. This project aims at helping homeowners save energy to reduce expenses, but its loftier goals include reducing pollution and fossil fuel usage.



Educating homeowners is the key to achieving those goals. To that end, the partners will sponsor televised public service announcements and seminars at home centers. They've also published a free booklet featuring over 100 ways to reduce energy consumption year-round. The booklet also contains a guide to manufacturers of energy-saving products and to organizations promoting efficiency.

To get a copy of the Energy Savers booklet, call the U.S. Department of Energy at (800) 363-3732.

## Booklet Offers Siding Care Solutions

No matter what type of exterior siding your house has — even if it's claimed to be "maintenance-free" — it will require some periodic attention to keep it in top condition.

You may only need to clean and check for loose fasteners. Or you may have to paint, patch, and recaulk joints.

To make siding care simpler, ABT Building Products Corporation (ABTco) is offering a free guide, titled *Making a House Call*, that outlines basic siding maintenance procedures.

Pick up the free pamphlet where you buy building materials, or by calling ABTco at (800) 566-2282.



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## Turn An Old End Table Into Something Great In About Half An Hour.

Here's How:

**Step 1** Remove all hardware from the piece (knobs, etc.). In a well-ventilated area, strip the finish with Krylon® OFF! Paint and Varnish Stripper. Scrape off old paint/varnish.



**Step 2** Sand using medium grit paper (120, 150). Wipe clean with a tack cloth.



**Step 3** Prime with Krylon Sandable Primer. Choose a primer color based on finished color of project.

**Step 4** Sand with fine grit paper (220).

**Step 5** If you're doing multiple colors, mask off the areas you don't want painted. Apply two coats of Krylon spray paint.



(NOTE: Because of Krylon's special formulation, you can apply the second coat at any time.)

### Krylon Helpful Hint

Why use a primer? A primer is excellent for surface preparation because it fills nicks, scratches, and imperfections. It also smoothes the finish for a better appearance, enhances color clarity, and improves paint adhesion and long-term durability.

For other great project ideas, get a 30-Minute Makeover booklet at a retailer near you or call 1-800-4-KRYLON. Look for other added-value offers and our 30-Minute Makeover contest details.

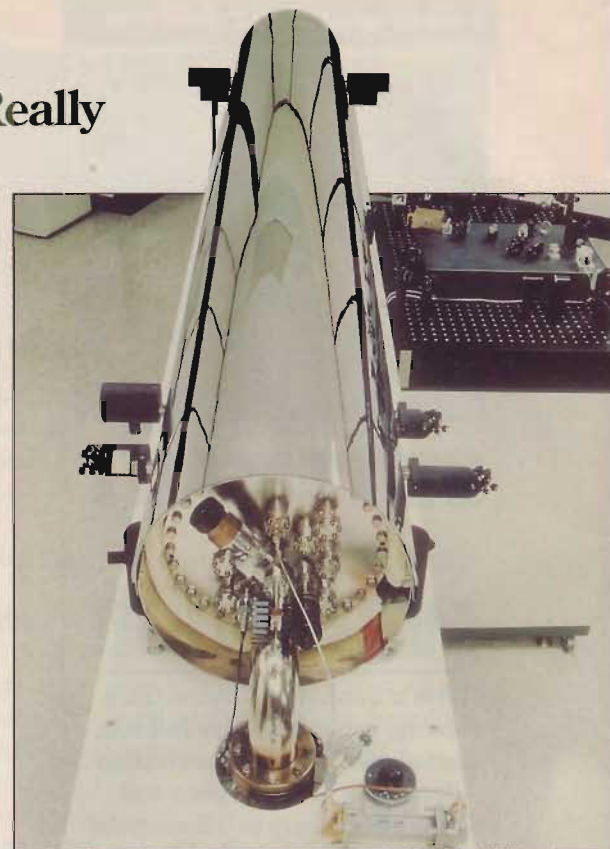


## Does Anybody Really Know What Time It Is?

For some people, close enough is good enough. Others, though, demand that everything be exactly dead-on. Ask the first type of person for the time of day, and you'll likely hear a generalization such as "about a quarter after ten." Ask the other, and you'll hear "exactly 10:17." It's for this latter kind of person that the folks at Klockit introduced the Radio Controlled Clock Movement.

The radio signal that controls this clock is broadcast from the National Institute of Standards and Technology's atomic clock in Fort Collins, Colorado. This clock sets the official national time standard and is very accurate. And I mean accurate, as in correct to within one second every six million years! This standard has long been used to set the time at government installations and important facilities.

If knowing the exact time is important to you, Klockit's Radio Controlled Movement offers an affordable way you can find out. The movement receives the atomic clock signal and adjusts itself daily. In addition, the movement resets itself automatically during the annual daylight savings time changes. If the batteries run down, it's no problem.



The NIST Atomic Clock sets the national time standard, accurate to within one second every six million years.

Replace them with fresh cells, and your clock will reset itself to the correct time.

The only real restriction with this movement is that you have to use a wooden, paper, or plastic dial. Metal clock dials won't work; they interfere with the unit's radio receiver.

All this technology is stuffed into a movement less than 3"-wide by 4"-long and 1/2"-thick, which sells for under \$30. For more information on the Radio Controlled Movement, call Klockit at (800) 556-2548.

## Free Help for Halogen Lamp Owners

Torchiere floor lamps with halogen bulbs have been tied to at least 189 fires and 11 deaths since 1992. The fire hazard is due to the halogen bulb that sits exposed in a shallow bowl atop of the lamp. If the lamp is close to combustible objects, or if an object comes to rest atop the lamp, the bulb's heat can quickly start a fire.

In February 1997 new Underwriter's Laboratories (UL) standards were put into place that mandate the bulbs on new lamps be repositioned and/or covered by a protective guard, making them safer. But with about 40 million of the old-style lamps still in use, concerns about halogen bulb safety remain.

If you have an old-style torchiere fixture, you can get a free bulb guard through a program set up by the Consumer Product Safety Commission and lamp manufacturers. To find out where to get a guard, call (800) 985-2220.





# Garden Tool Shed

*Ever hear joke routines that open with “You know you’re old when . . .”? I used to think they were funny. Today, however, I am not amused. It’s not just that my legs went south when I*

tried to play soccer after a 10-year layoff, or that my waistline is taking on real estate more steadily than a glacier in an ice age. No, this is much more serious.

It’s the warm weather that’s got me worried. Back in my college days, summer meant biking to the beach to gawk at the, er, scenery. Nowadays I get a whiff of balmy air and start thinking about landscaping, or building something outside. I’m not sure how this happened.

Of course, a lot of people get the outdoor bug when the sun starts making longer appearances. As if to prove the point, the results of our reader survey came in with a clear leader in the projects-wanted cate-

gory — a large number of you hope to build a tool storage shed.

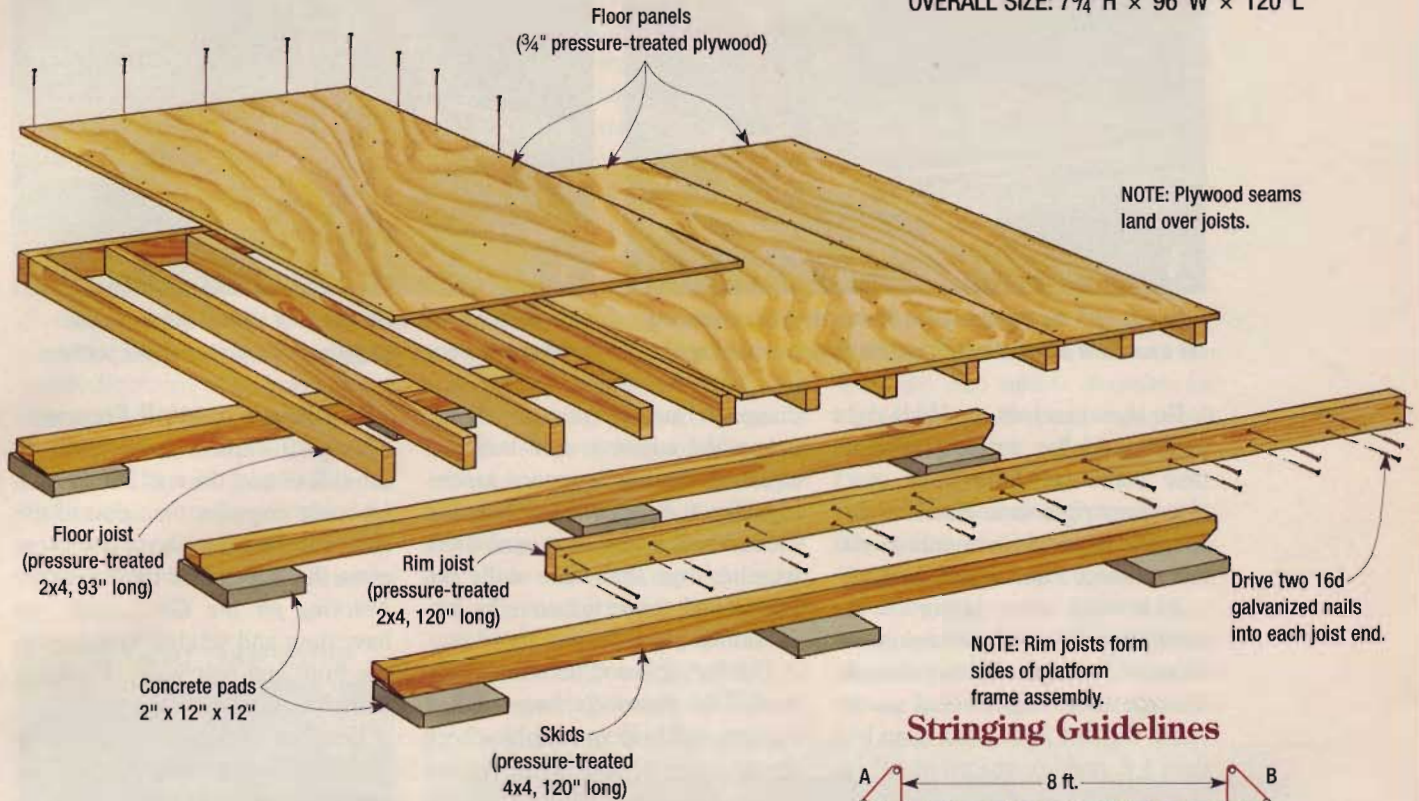
The timing couldn’t have been better. The staff at *Garden Gate*, our sister publication, had asked us to build a shed for their garden tools at the *Workbench* house. They help us out with the landscaping there, so we were happy to oblige.



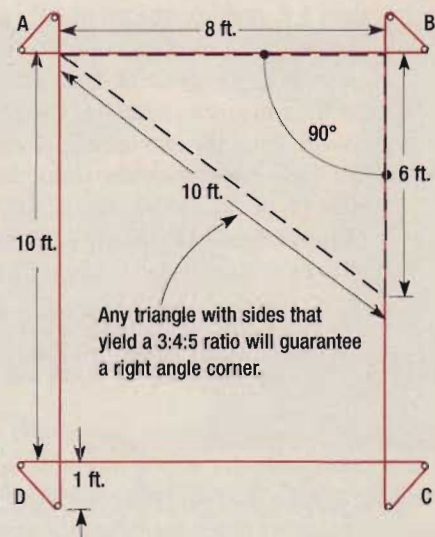


# Platform Construction View

OVERALL SIZE: 7 $\frac{3}{4}$ "H x 96"W x 120"L



## Stringing Guidelines



Besides, they said my budding interest in all things green just means that I'm awfully mature for my (tender) age. Hard to say no when they put it that way.

Aside from the satisfaction of building the shed yourself, this project offers plenty of bonuses — a strong frame, good ventilation, a built-in workbench, and a loft to boost your storage space. Best of all, it's simple to build, and teaches skills you can use elsewhere.

### Laying the Groundwork

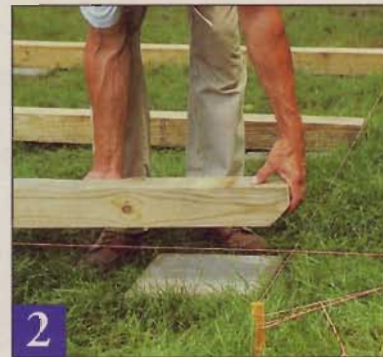
Floor options for a shed can include anything from a concrete slab to a gravel bed rimmed by landscape timbers. We opted for a wood platform. The platform frame attaches to 4x4 pressure-treated skids, so the shed can be moved with help from a truck, and the skids rest on nine 12" concrete pads (**Platform Construction View**).

We started by using nylon line to establish guidelines for the shed's footprint. To do this, drive two wood stakes 10 ft. apart and tie a line between them to mark the rear of

the shed (**Stringing Guidelines**). Next, set two stakes 8 ft. apart and 1 ft. behind that line (at corners A and B), wrap the string around one and bring it forward to mark a side wall from B to C. Measure a 6-8-10 triangle (to adjust each corner for square) as you drive and tie off additional stakes to mark the other walls of the shed. Next, set the concrete pads in place (**Figure 1**). The pads must sit squarely under the center of each skid and be level with each other so the skids are aligned properly (**Figure 2**).



Position the concrete pads so they'll be centered directly under the skids. All nine pads must be level with each other.



Pressure-treated 4x4's, with a generous 45° bevel at each end, serve as skids. Use the guideline strings to position them.





After you mark the layout lines on the two rim joists (indicating the location of each floor joist), nail the platform frame together.



Align the frame and skids, check for square, and fasten them together. Then screw the plywood flooring to the joist platform.

Go ahead and set the skids right to the guideline strings, but don't take pains tweaking their exact placement right now. You'll be able to make minor adjustments as you add the floor framing and decking.

To prevent water damage to the shed base, we used pressure-treated stock throughout this assembly. Though they might seem undersized, the 2x4 floor joists span less than 4 ft. and are spaced at 12" on-center, giving us plenty of support.

You'll need a pair of 10-ft. 2x4's for the rim joists — the boards that mount along the two outside skids. You nail through these into the ends of the floor joists, creating the platform frame (Figure 3). When all the joists are nailed in place, take

diagonal measurements of the frame and adjust it until both are equal, indicating a square assembly. Align the edges of the skids and frame, then screw or toenail them together from the inside of the rim joists. Don't forget to fasten the center skid in place.

The 3/4" plywood flooring comes next. The plywood's large square corners will help you double-check the accuracy of your frame, so use them to align everything, then fasten the panels with 1 5/8"-long exterior deck screws (Figure 4). Working from front to back, install the two full sheets first, then the half-sheet. Each of the two seams should land over a joist so that all plywood edges are supported.

### Building the Wall Frames

Though the construction methods are still simple, the wall framing is a bit more complex than that of the platform. There are let-in braces, or girts, that strengthen the sides (see *Notching for the Girts*), and you have door and window openings in the front and rear walls (Framing Construction View).

Here we switched to regular fir framing lumber, using the deck as our work platform as we nailed the floor and wall plates to the studs (Figure 5). We set the girts in, secured them with a single nail at each end stud, then checked diagonals to get the frame square (Figure 6). When it was right, we nailed the girts twice at each stud.

## Notching for the Girts: Gang-Cutting Saves Time

To make our shed design really solid and provide a few more options for siding material, we added some framing details you won't find in prefab sheds. We used 4x4 corner posts for strength, and we let in horizontal 1x4 braces (called girts) along each side wall. In the days when barns and other buildings got board-

and-batten siding, these girts provided a nailing base and helped the walls resist racking from wind and other forces. Whatever the siding, though, the girts must lie flush with the frame. To accomplish this, we notched the studs and corner posts using a technique called "gang-cutting."



Align and clamp together the studs and posts for one wall frame. Mark layout lines for the notches, then make a series of 3/4"-deep cuts.



With the scoring cuts done, the bulk of the waste will break loose. Use a chisel (bevel up) to do most of the clearing work.



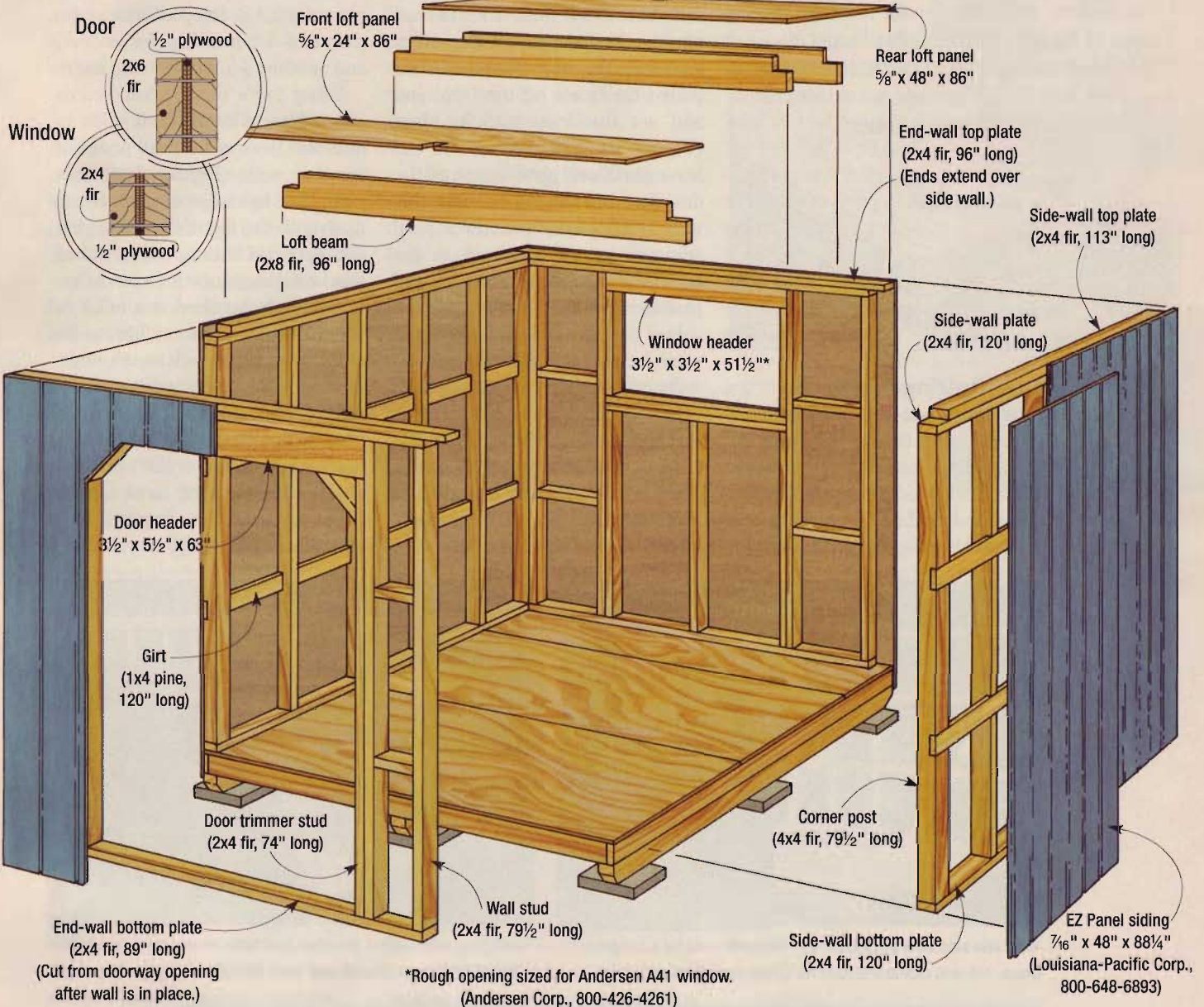
Clean up nibs and other high spots with a hand plane. You have to go across the grain, but minor tearout won't affect the joints.



# Framing Construction View

OVERALL SIZE: 91<sup>3</sup>/<sub>4</sub>"H x 96"W x 120"L (including platform assembly)

## Header Cross-Sections

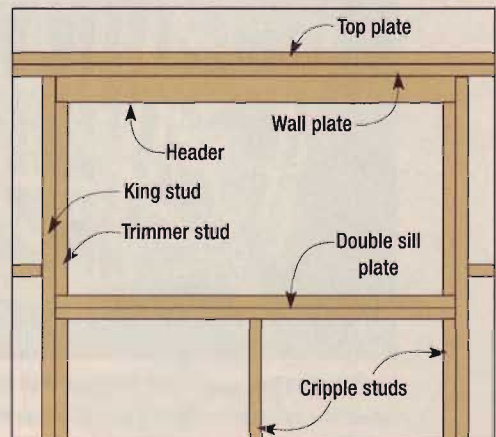


**5** Use the shed floor for a work platform as you build the walls. The notched edges of the studs and posts should face up.



**6** Secure the girts with a single nail at each end, then measure the frame diagonals. When you're squared up, nail in the girts.

## Window Framing Detail

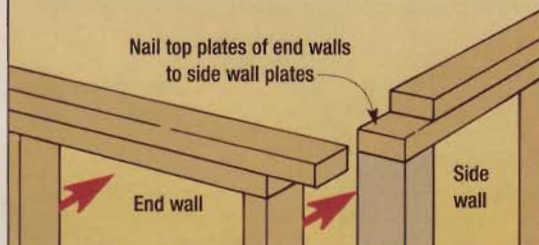




## PRO TIP

### Tie wall corners with top plates

Double top plates are a standard feature in "stick-frame" construction — the extra 2x4 layer helps tie the wall corners together. In our case, that meant extending the top plates of the front and rear walls 3½" at each end so we could nail through them into the side wall plates.



### Raising the Walls

Assemble each wall frame and set it aside until they're all ready to install. Then begin the installation by screwing one side wall to the floor and nailing a brace at the front end to steady it (Figure 7).

Next, raise the rear wall so you can get one corner locked in and plumb the walls together.

We nailed up another temporary 2x4 brace to hold the corner plumb, then we raised the other side wall (Figure 8). Finally, we pulled the brace off the front end and set the front wall in place (Figure 9). (If you want, you can leave the floor plate intact at the doorway opening until after this wall is secured.) Whatever final adjustments are required to get each wall standing straight and plumb, make them now. Once the siding panels start going up, you won't be able to budge the walls.

As you finish nailing the wall corners, check the alignment of the top plates. These are extra 2x4's nailed onto the wall plates. They add strength to support the roof, and overlap to tie the corners together securely (Pro Tip).

### Loft Storage

If you want to equip your shed with the built-in storage loft, now is the time to do it. Our design has room for a 4-ft. loft platform at the rear, a 4-ft. open bay for access, and another 2-ft. platform up front.

Using 2x8's for the loft beams allowed us to notch their ends to fit under the top and wall plates of the side walls (Figure 10). This made the top edge of each beam flush with the top of the walls, and still kept the bottom edges out of head-banging range for most folks.

Although the shed is a full 8 ft. wide, the loft plywood has to be cut a little short so it won't interfere with the lower edges of the rafters. We cut our panels 86" long, then centered a notch in the edges that landed on top of the front and rear walls — leaving room for the ridge posts still to come (Loft Installation Detail).



With one side wall screwed to the floor and held by a temporary brace, set and plumb the rear wall, then nail the plate corners.



Work your way around the shed perimeter as you raise the walls. Most of the braces should stay until after the siding goes up.



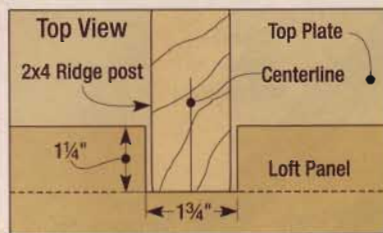
We fastened the top plate to the front wall before raising it, then nailed the extended ends to the wall plates of the side walls.



Notch the loft beams so the top edges are flush with the walls. Set two beams for the rear loft, skip a stud, then add front beam.



## Loft Installation Detail



These notches let you keep the edge of each loft panel resting on a top plate. Support from the front and rear walls is critical — the panels don't reach to the side walls.

The roof framing isn't far off at this stage, and once it's done you'll have no room to maneuver the loft plywood into position, so take care of that step now (**Figure 11**). Just make sure the panels are centered along the end walls, so the notches are positioned correctly for the ridge posts. The other edge of each panel should sit squarely over a support beam but not extend past it. Screw the panels to the 2x8 beams so they can't shift.

### Going for Cover

The siding option you choose for your shed is just that — an option. You may decide to match materials on your home, or you may have to comply with design restrictions in a planned community.

In any event, this shed design offers you the flexibility to do that. Cedar shingles will require support sheathing underneath, and I'd recommend the same for vinyl siding. Just about anything else can go on right over the studs.

Panelized siding offers a mix of strength and economy, and that's what we chose. Louisiana-Pacific Corp. (800-648-6893) recently introduced an engineered wood product, *EZ Panel*, designed for utility buildings and other low-cost applications. Like T-111 plywood siding, its exterior face has grooves and a wood grain texture, but *EZ Panel* comes preprimed and is a compressed wood/resin composite, not a plywood. It's closer to oriented strand board, but it's denser and has lapped edges.



**11** The loft plywood has to go on before you get to the roof framing. We cut our panels 86" long, notched the outboard edges for the ridge posts, then screwed them in place.



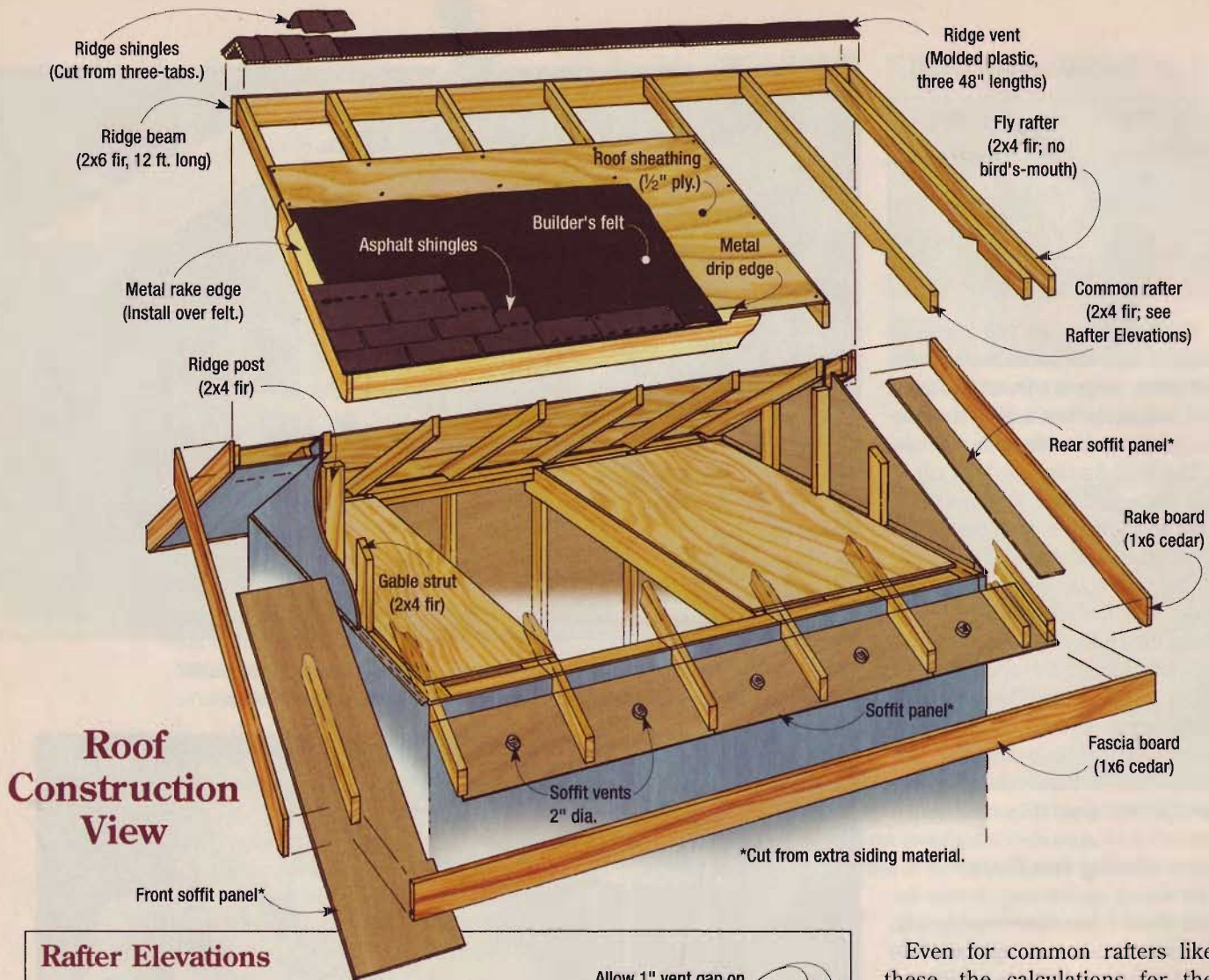
**12** A temporary ledger board provided support for the siding panels while we installed them. The bottom edge of the siding extends  $\frac{3}{4}$ " below the top edge of the skids.

To make the installation easier, we snapped a chalk line  $\frac{3}{4}$ " below the top edge of the outside skids and screwed a support ledger in place. We rested the panels on the ledger, lined them up with our studs, and fastened the siding with 6d galvanized nails (**Figure 12**). The corners will be covered later with trim battens, so don't worry about lapping or joining them. Just mark and cut out the window and door openings (**Figure 13**).



**13** Mark the window corners by drilling small guide holes from inside the shed, then lay out and jigsaw the cutout in the siding.

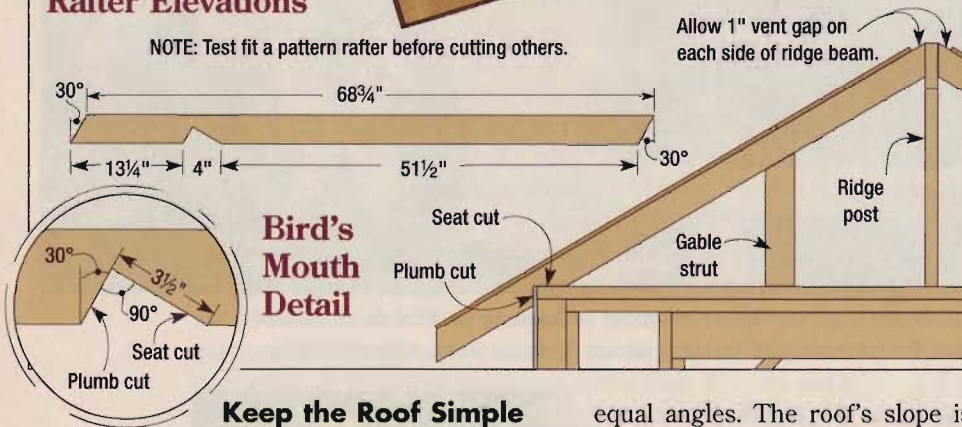




## Roof Construction View

### Rafter Elevations

NOTE: Test fit a pattern rafter before cutting others.



### Bird's Mouth Detail

#### Keep the Roof Simple

Because it introduces angled cuts and geometry, roof framing often leaves fledgling carpenters feeling overwhelmed. This is especially true of complex intersecting roofs with multiple angles and planes. We chose one of the simplest roof types — the gable — to keep this part of the project manageable (**Roof Construction View**.)

A gable roof has a single ridge and two sloping faces pitched at

equal angles. The roof's slope is described in terms of rise over run — rise denotes the vertical distance from the top plate to the top of the ridge, and run denotes the horizontal distance from the outside of the wall to the centerline of the ridge. To keep the calculation method standard, the unit of run is always 12". Our shed roof is built to a 7-in-12 slope, which means it rises 7" for every 12" of horizontal distance.

Even for common rafters like these, the calculations for the bird's-mouth notch and rafter tail take some explaining. But rather than bog you down in theory, we've provided a pattern to use for layout (**Rafter Elevations**). If you really want to learn the art and science of roof building, you'll need a full-length text on framing.

Veteran framers usually test-fit a pair of rafters before they cut the others, and we did the same. With the bird's-mouths seated on the top plates, the upper ends of the rafters should extend almost to the center of the ridge line, leaving a gap just wide enough for the ridge beam — in our case 1 1/2".

Don't be afraid to deviate a little from the measurements we've provided — slight variations in your wall framing may require it. Once you're happy with the test fit, mark your "pattern" rafter and use it to lay out the rest (**Figure 14**).





**14** Test fit one or two rafters to get the dimensions right, then use the "pattern" rafter to do layout marking on the rest.



**15** Clamp the rafters together to gang-cut the 30° plumb cut for the bird's-mouth. Use a jig saw for the seat cuts, one at a time.



**16** Install the first rafters at the ends of the shed, fastening them to the top plates. The center gap at the top measures 1 1/2", enough room to accommodate our 2x6 ridge beam.

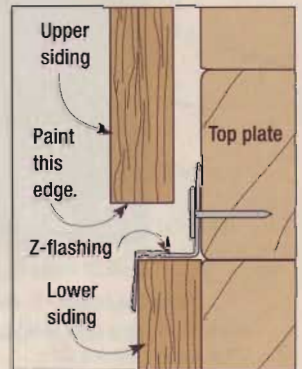


**17** The loft makes a nice work platform for installing the ridge beam. The beam's front end overhangs the shed by 18", the back by 6".



**18** After you install the common rafters, add the ridge posts, gable struts, and the upper siding.

### Z-Flashing Detail



### Fitting the Rafters

The plumb cuts at the ends of each rafter will have to be made one or two at a time, but like the girt notches, the bird's-mouths can be gang-cut to save time — at least one of the cuts can be. Clamp all but the four fly rafters together — bottom edges up and ends aligned — and use a circular saw to make the 30° cut across the batch (Figure 15). The angle for the seat cuts is too sharp for this method, so cut these individually

with a jig saw or hand saw.

Install the end rafters first, fastening through the bird's-mouth into the top plate (Figure 16). When both pairs are up, set the ridge beam in place with the overhang at each end — 18" at the front, 6" rear — and fasten the top ends of the rafters (Figure 17).

the fascia to the tail ends of the main and fly rafters (Figure 19). The 1x6 caps at the front and rear edges — called rake boards — can wait for now. Next, nail the roof sheathing in place (Figure 20). Keep the end joints staggered and landing over rafters, and on each side leave a 1" gap between the plywood sheathing and the ridge beam. This space will allow air from inside the shed to circulate up through the ridge vent.

Mount the rest of the rafters the same way, each positioned over a stud in the wall. When they're all in, cut and install the ridge posts and struts (Figure 18). Then add the rest of the siding to fill in the triangular space at the top of the front and rear walls. Because an unprotected butt joint between the upper and lower panels would certainly allow water penetration, we used metal flashing here to create a much more weatherproof lap joint (Z-Flashing Detail).

To finish the roof frame, you have to cut and install the 1x6 cedar fascia boards. We used a table saw to cut an angled groove for the soffit material, then nailed



**19** Cut an angled groove (for the soffit panels) in the fascia, then nail it to the rafter tails. The fly rafters can then be nailed in place.



**20** You can nail the sheathing down as soon as the roof frame is complete. Start at the bottom edge, and offset the end joints of the lower and upper panels as you work up.





**21** The angled groove cut in the fascia boards provides support for the soffit panels. The top edges rest snugly against the siding.



**22** Drill 2" holes in the soffit panels (between the rafters) to house the soffit vents. Test fit a vent in scrap before drilling the holes.



**23** We used self-rimming soffit vents, fitted with screen mesh that keeps out insects. They press in, so the fit has to be snug.



**24** After we painted the siding, we installed our awning window in the rear wall. The nailing flange will be covered with trim later.



**25** Aluminum drip edge flashing will keep water runoff away from the wood fascia. Nail it to the sheathing before the felt goes on.

## Working on the Details

The structural work on the shed is wrapped up at this stage, but a number of details remain. Aside from the obvious need for roofing and an entry door, we still have the soffit panels, vents, window, and trim to install.

If you'll recall, we left the plywood roof sheathing about an inch shy on each side of the ridge beam. These gaps will allow warm air to rise up through the ridge vent so the shed doesn't turn into a sauna on a hot August afternoon, but they can't work right without a source for incoming air, which we provided via soffit vents.

First, we cut soffit panels from the EZ Panel siding and fitted them into the grooves in our fascia boards (Figure 21). We slid the center sections in from the ends, then cut and fitted longer panels to cover the front and rear roof overhangs. No trim is required except the 1x6 rake boards at the gable ends. You can install those now.

Soffit vents come in various types and sizes, but we opted for simple metal ones that just press-fit into place. Installation required only a 2"-diameter hole, which we drilled with an adjustable hole saw (Figure 22). The size of these vents can vary slightly, so try a test run with your hole saw (in scrap) to make sure the fit is snug enough to keep the vent from dropping out. To install, just press a vent in each hole (Figure 23).

Ideally, the total surface area for intake and exhaust vents should be about equal. This is more critical in a house; for a project like this the ratio is less important. We used one vent per rafter bay on each side, for a total of 10.

If necessary, the window in the rear wall of the shed can make up for any shortage of vent area. We installed an Andersen A41 awning window in our shed (Figure 24). The dual-pane glass and vinyl-clad exterior are nice features, but the bonus is really the awning design itself. An awning window swings out at the bottom, so if you leave it open deliberately for a little extra ventilation, or just forget to crank it closed, you don't have to worry about the shed interior and contents getting soaked from a summer thunderstorm.

## Speaking of Rainfall

Unless you live in a desert climate, getting the roof watertight should be your next priority. We've provided a separate section on the basics of roofing with asphalt shingles (see *A Roofing Primer*), but you need to take care of some trim details before you start that.

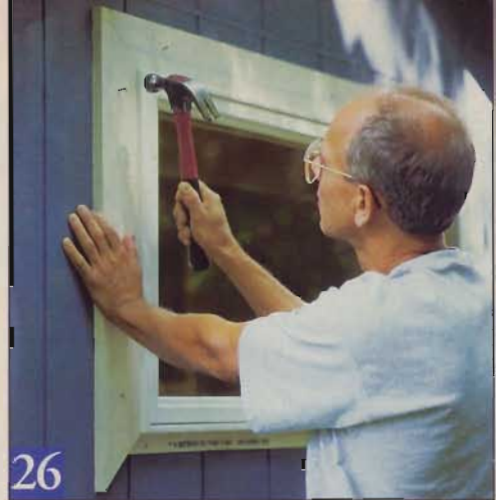
If you've ever filled a glass to overflowing with water, you may have noticed that the liquid forms a small dome that's actually higher than the glass rim. This happens because water has surface tension that causes it to cling to objects rather than flow freely off of them.



On sloped or vertical surfaces, a sharp bottom edge will overcome the tension and let the water fall free, and that's what you need to accomplish at the roof edge.

Fortunately, the fix is quick and inexpensive. Aluminum flashing called "drip edge" extends the roof plane past the fascia boards and has that sharp edge built in. You just nail it to the roof sheathing at the lower edge (Figure 25). Some suppliers sell plastic drip edge, which works the same way.

The other vulnerable areas of the shed include the window and door openings and the corners. Trim boards and caulking help out here. Our Andersen awning window had a full-perimeter nailing flange, so after we installed and fastened it we nailed 1x cedar trim over the flange (Figure 26). If you're using a different accent color like we did, I'd suggest painting (or staining) the cedar trim before you install it. It's faster and makes for less cleanup work.



To help seal the window, we applied caulk to the back of the cedar trim before nailing it to the siding.

## A Roofing Primer: The Basics of Three-Tab Asphalt Shingles

Water flows downhill. For seasoned roofers who take their craft seriously and beginners still trying to figure it all out, these three words represent the physics they must not forget. Everything else is just a footnote.

All successful roofing techniques work by directing the flow of water rather than trying to stop it. A sloped roof plane is an obvious start, but that's not enough. You still need a watertight surface, and since it isn't practical to cover roofs with large one-piece shields, you have to use layers of smaller pieces. Every intersection is a potential leak, though. The key is arranging each new layer to overlap the one below, so water follows its natural path down.

After the sheathing and drip-edge go on, staple on a layer of 15-lb. or 30-lb. felt, a heavy asphalt-impregnated paper. Start at the drip edge and work up, overlapping each course. Cover the ends with metal rake edge.

A starter course of shingles is next. You make these by cutting the tabs off full shingles and nailing on just the top portion.

A course of full shingles goes directly over the starters, with the end joints staggered 6", an offset that is repeated with each new course.

Common asphalt shingles typically measure 12" tall by 36" wide and have two partial slits that divide the lower half into three "tabs". Once the starter and first full course are down, new layers cover about 7" of the shingles below, leaving a 5" reveal. The offset joints prevent water from getting underneath the shingles.

To cover the ridge, cut shingles at the slits to get three square tabs, and nail them over the vent.

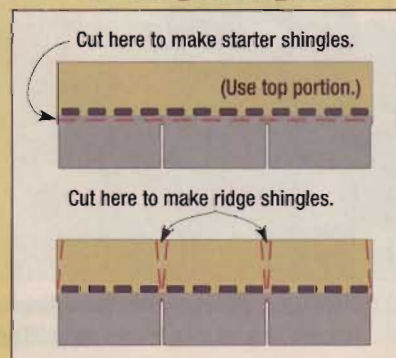


Builder's felt is the first layer of protection for the sheathing. Cover the drip edge and work up. Add rake flashing at the ends.



A starter course makes for a double layer of shingles at the bottom edge of the roof. Cut the tabs off regular shingles to make these.

### Cutting Shingles



Offset the end joints of each course 6" from the one below. You can use the remnants from cut shingles as starter pieces above.



After nailing on a ridge vent, cut some "three-tabs" into 12"-square shingles for the ridge. Install with a 5" reveal, same as on the slope.





**27** Cedar battens butt together to trim the corners. Install the narrow battens on the side walls, the wide trim on the ends.



**28** Mark the hinge locations on the inside face of the door trim and trace around a hinge plate. Then rout a shallow mortise.

### Door and Trim Wrap it Up

This shed is definitely a project most people want to build in steps rather than all at once. By the time I got the roof shingled, though, I was like a horse headed back to a warm stable — determined to get home with no major delays. It was mid-afternoon on a Saturday, and I figured I could cut and install the corner trim, then build the door before the weekend was over (see *Adding A Door*).


To keep the look balanced, the cedar battens for the shed's corners have to be ripped to two different widths — unless you want to bevel the mating edges at a 45° angle, an unnecessary complication. On long stock like this, butt joints are much easier.

Rough-sawn 1x cedar typically measures about 7/8" thick, so you just have to deduct that from the width of one batten. In our case, we wanted a 3" reveal, so the first batten at each corner was cut 2 1/8" wide and nailed to the side wall, flush with the siding on the end

wall. The second batten, measuring 3" wide, finishes the corner (**Figure 27**). Note the different cuts on the top end of each batten. The narrow battens, installed on the side walls, have the top end bevel-cut 30° to match the slope of the eave. The full-width battens, installed on the front and rear walls, get a 30° miter cut to match.

The doorway trim is almost as straightforward, but it has to go on after the door is installed. We surface-mounted the door hinges to the shed siding, and for reasons of both aesthetics and security, we wanted to conceal them with the trim. We routed two shallow mortises in the back of each vertical door casing so it would nest over the hinge plates (**Figure 28**). Layout the mortises by marking the hinge locations and tracing around the plate. Cut the bottom ends of the two long vertical casings square, and all the other trim ends at 22 1/2°, then nail them in place (**Figure 29**).

We're always after extra features that make a project better, and we had a few in mind even before we finished building the shed (see *Shed Accessories* on page 38).

Whether or not you decide to add these custom touches to your shed, you'll still have room for almost any outdoor power equipment, plus an entire arsenal of gardening tools. Storage problems rarely get solved for good, but here's to stemming the tide. 

### What You'll Need

#### Lumber

- (3) 3/4" x 4 ft. x 8 ft. pressure-treated pine plywood
- (2) 5/8" x 4 ft. x 8 ft. ACX fir or pine plywood
- (12) 1/2" x 4 ft. x 8 ft. siding
- (3) 10 ft. pressure-treated 4x4s
- (3) 10 ft. pressure-treated 2x4s
- (11) 8 ft. pressure-treated 2x4s
- (4) 8 ft. fir 4x4 posts
- (6) 10 ft. fir 2x4's
- (36) 8 ft. fir 2x4's
- (8) 12 ft. fir 2x4's
- (3) 8 ft. 2x8's
- (2) 12 ft. fir 2x6's
- (20) 8 ft. 1x4 cedar
- (4) 12 ft. 1x6 cedar
- (10) 8 ft. 1x6 tongue-and-groove cedar

(FINISHES: 2 gals. solid color stain for siding; 1 qt. solid color stain for trim.)

#### Hardware

- (9) concrete pads (2" thick)
- (4) T-hinges (min. 4" long)
- (2) slide bolts (min. 3" long)
- (1) door/gate latch
- (5) lbs. 6d galvanized nails
- (10) lbs. 16d galvanized nails
- (6) lbs. 1 1/4" roofing nails
- (2) lengths (10 ft.) Z-flashing
- (3) lengths (10 ft.) drip edge
- (3) lengths (10 ft.) rake edge
- (1) roll 15# or 30# builder's felt
- (6) bundles asphalt shingles
- (3) lengths (4 ft.) ridge vent
- (10) 2"-dia. soffit vents
- (3) lbs. #8 x 2 1/2" deck screws
- (2) lbs. #8 x 1 5/8" deck screws
- (1) lb. #6 x 1 1/4" galv. screws
- (1) Andersen A41 awning window. (Modify framing if using another size/type window.)



**29** The routed pockets nest over the hinges. Cut the ends of each trim piece at 22 1/2° to turn the 45° corners around the door.



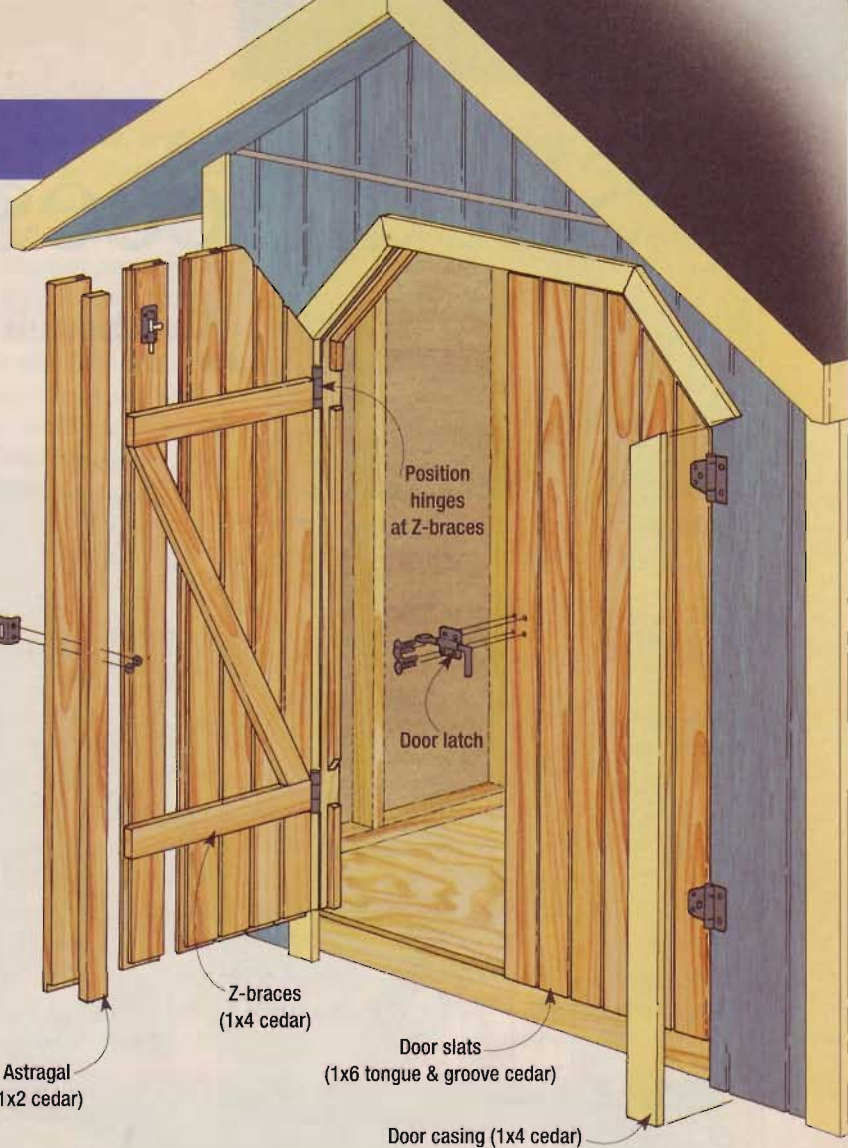
# Adding a Door

The size and style of your shed door can vary according to what has to get through it. The dimensions we chose allow a lawn tractor with a 48" mowing deck to enter and exit comfortably. At nearly 60" wide, however, a single door would have been heavy and unstable. By using double doors made of 1x6 tongue-and-groove cedar, we kept the weight manageable.

Start by ripping the grooved edge off of two boards. Use one as the starter board for the first door, lining up the remaining slats by nesting the tongues and grooves together. Lightly clamp the panel together (face down), sight along the assembly to check flatness, then screw the Z-brace pieces to the backs of the tongue-and-groove boards. Assemble the second door the same way.

Trimming to fit involves cutting off the 45° corner at the top and routing a clearance rabbet along the bottom. You can plane the inside edges to final width after both doors are hung.

Mount the hinges on the front face of each door, over the brace locations so the screws have more to grab. Fasten the short leg of the hinge to the siding, then cover it with cedar trim.



Screw horizontal and diagonal braces to each tongue-and-groove cedar door panel.



Scribe a template from the top of the door frame, then use it to lay out and cut the doors.



A wide, shallow rabbet allows the bottom edges of the doors to close against the shed floor.



For added security, we substituted a 1/4" carriage bolt for one of the hinge-plate screws.



Use a shim (or an extra hinge plate) to create a 1/8" gap around each door edge.



We nailed cedar 1x2 stock in place for a door stop molding. It also helps keep insects out.



A narrow wood strip, called an astragal, bridges the door gap. Fasten it to the left-hand door.



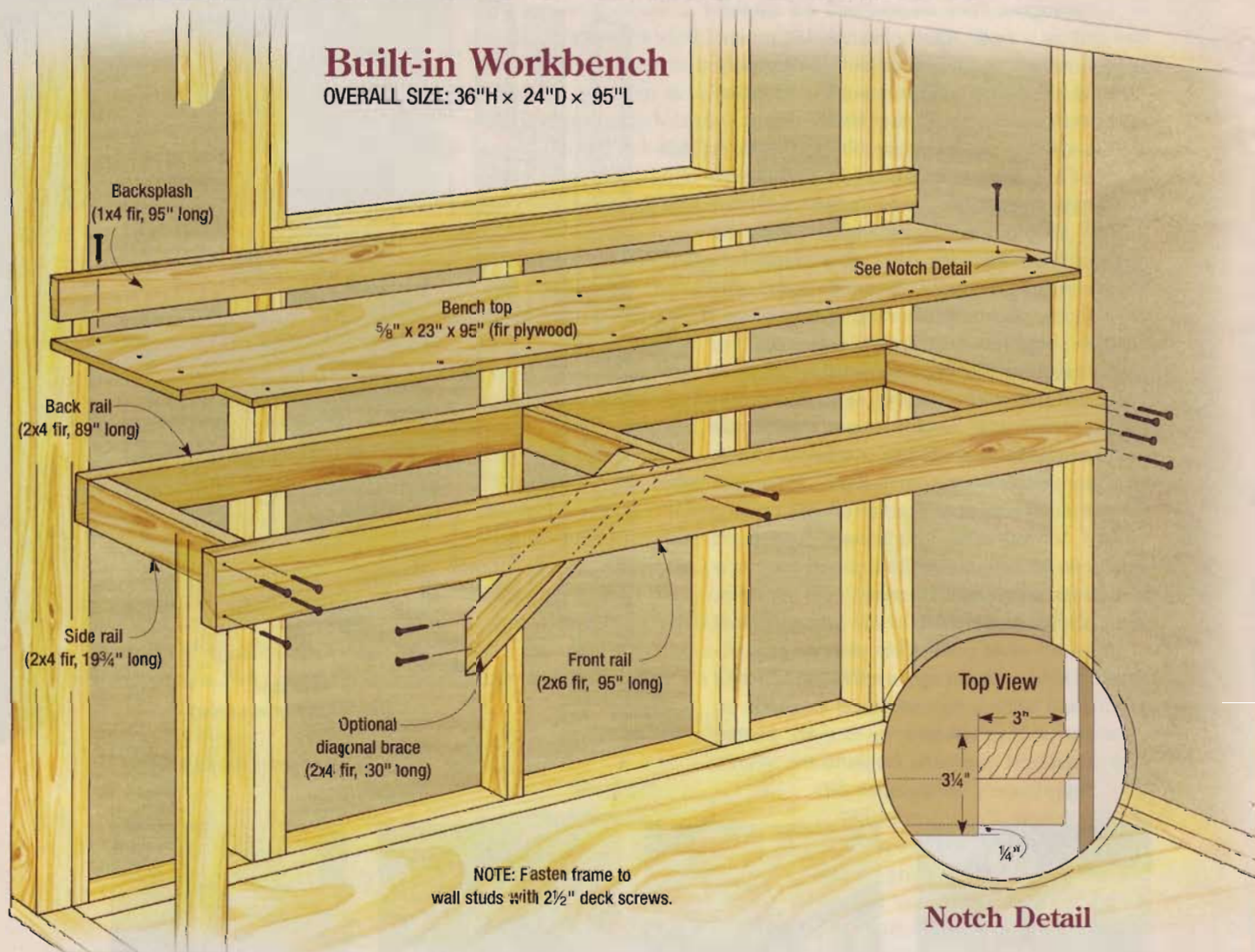
The left-hand door gets slide bolts top and bottom (inset); the right door gets the latch.



# Shed Accessories

## Built-in Workbench

OVERALL SIZE: 36"H x 24"D x 95"L



*If building the garden shed whets your appetite for outdoor woodworking, you don't have to stop there. One of the rewards of the project is the added convenience it provides*

for working around the yard, and you can make the most of that virtue by adding a few accessories.

There's certainly room for hooks, shelves, and other hardware to hang rakes, hoses, and other seasonal tools, but we focused first on making the shed more functional and accessible.

We started with a built-in workbench, installed at the rear wall. Of course it's possible just to bring in a freestanding bench, but this approach gives you the work surface without really sacrificing the floor space below.

The support frame for the bench borrows the construction methods used to frame the shed walls, with a few minor differences. Use the dimensions given for reference, but measure your shed just in case your wall framing varies. We nailed the stock together just like studs and wall plates, but used a 2x6 for the front rail to make sure the bench was sturdy enough.

Note that the front rail extends 3" beyond each end of the frame. This allowed us to anchor it to studs in the shed side walls. We screwed the back rail of the frame to studs in the rear wall.

The optional center brace can beef up the bench for heavy loads.

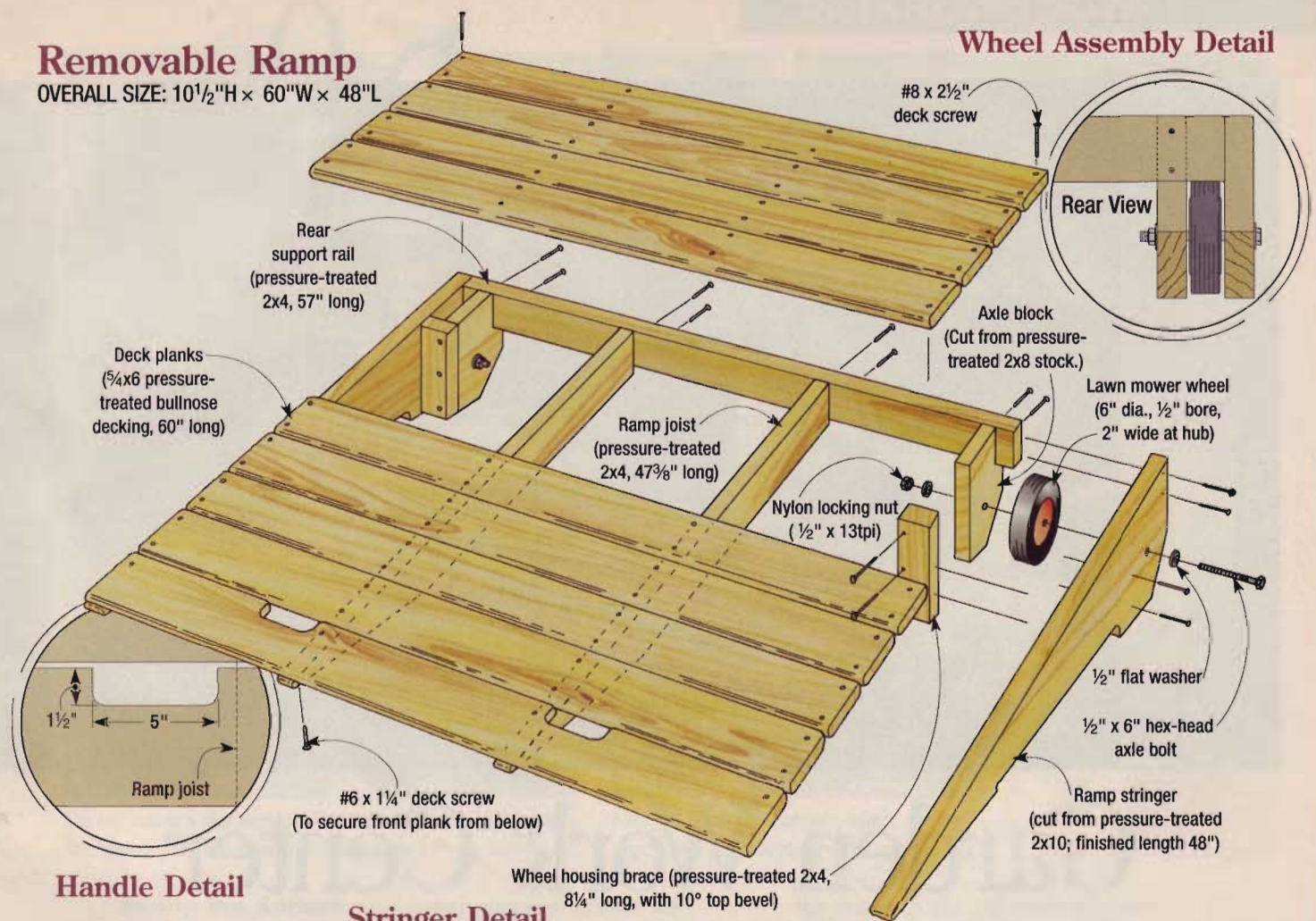
The plywood top came from the half-sheet we had leftover from the front loft panel. We extended the plywood into the stud bays by cutting notches near the front corners so we could drop it behind the first wall stud. A 1x4 "backsplash" — added to keep small items from dropping off behind the bench — completes the top.



## Removable Ramp

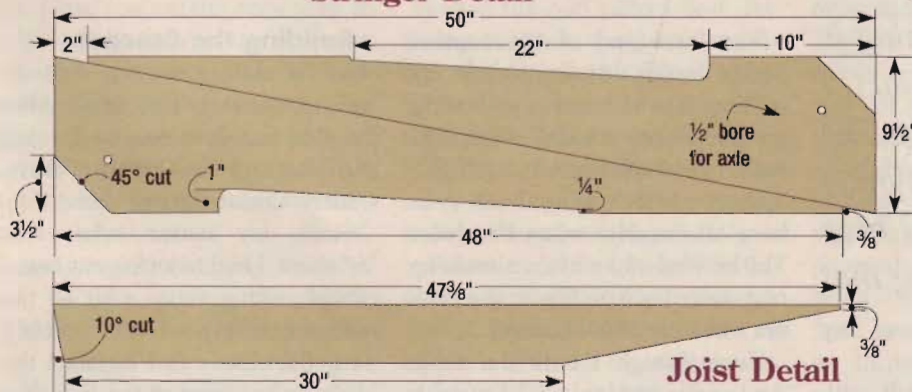
OVERALL SIZE: 10½"H x 60"W x 48"L

## Wheel Assembly Detail

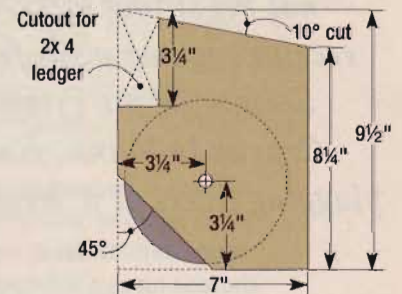


## Handle Detail

## Stringer Detail



## Axle Block Detail



The other accessory we built — a wood ramp — is a must for getting a wheelbarrow, lawn tractor, or other large rolling item in and out of the shed. Like the skids and the shed platform, the ramp sits at ground level and will get plenty wet, so we built it out of pressure-treated lumber.

The ramp must be stout enough to support heavy loads, a requirement that makes it heavy as well. No big deal if it stays put, but any trimming and mowing around the

shed will be easier if the ramp is portable. There's too much weight and bulk there to carry, however, so we fitted the ramp with wheels.

We cut the ramp stringers from a length of 2x10, taking a healthy 45° cut at the lower back corners. This alone makes the ramp easier to drag away from the shed, but it doesn't help when it's time to push it back in place. A pair of 6" lawn mower wheels takes care of that.

An axle block, cut with the same 45° relief angle as the stringers,

provides support for the inboard end of each axle bolt, and a short 2x4 brace bridges each wheel pocket. The rest of the ramp structure includes two support runners plus a 2x4 rail that helps tie the back end of the ramp together.

The ramp surface consists of pressure-treated 5/4 decking. The front plank gets handle cutouts and has its leading edge fastened from underneath, but the rest we simply cut to length and screwed down to the frame. ▀





# Garden Work Center

*You could say that gardening is not my strong suit. In fact, I receive regular visits from The Society for the Prevention of Cruelty to Plants. But I keep plugging away at it, hoping that*

some day at least one of my thumbs turns a little green.

Despite my lack of skill with plants, I can't resist applying many of the same organizational habits to my gardening tools and supplies that I use in my wood shop. You've already seen the *Tool Storage Shed* we built to store yard and garden equipment (page 26). Now, to complement the shed, I've built this garden work center to hang from the shed's wall. Keeping frequently used tools and supplies within easy reach of the garden is convenient, and allows me to enjoy working outside on sunny summer days.

The best part of the cabinet design is the drop-front door. By making it with slats and leaving gaps between each slat, any spilled water or soil falls right through. For a quick housecleaning, I can even hose off the door when I'm done. The beveled edges of the slats keep rain water from getting in the cabinet when the door is closed.

Even though I built the work center for gardening, it's adaptable to other uses. With a solid door instead of slats, for example, I could use it for storing automotive supplies.

Hardwood and fancy joinery could also dress up this design, but for use outside, keeping the construction simple is essential. Using rough-sawn cedar and rabet joinery made the work center easy to build, and deck screws provided plenty of strength at the joints.

## Building the Carcase

Start by cutting the top, bottom, and side panels to size, then rabbet the side panels to receive the top and bottom (**Garden Work Center Construction View**).

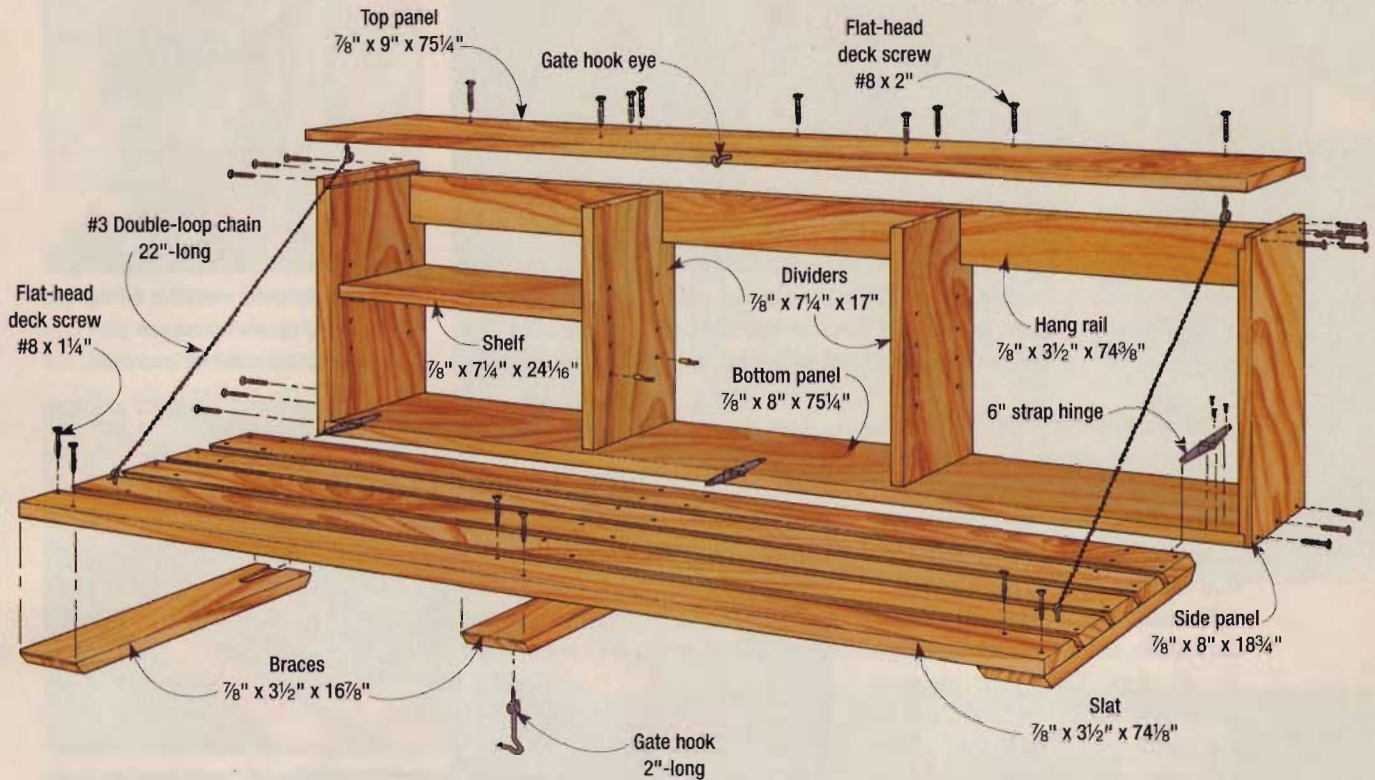
Since my cedar stock was  $\frac{7}{8}$ " thick, I had to jockey my usual rabbet cutting setup a bit — the widest dado my set cuts is  $\frac{13}{16}$ ". To get a wider cut, I installed the blade and positioned the fence for a  $\frac{7}{8}$ "-wide cut. Then, using the miter gauge for support, I made a pass with the end of the stock bearing against the





# Garden Work Center Construction View

OVERALL SIZE: 9"D x 76<sup>1</sup>/<sub>8</sub>"W x 18<sup>3</sup>/<sub>4</sub>"H



fence (Figure 1). To remove the remaining sliver of wood, I just ran the stock over the blade a second time after pulling the stock away from the fence a tad.

Once you've cut all the rabbets, hold the top panel in position against the side panels and drill countersunk <sup>5</sup>/<sub>32</sub>"-diameter pilot holes into the rabbet joints. Note: make sure the top panel sticks out 1" in front of the side panels. Spread exterior-grade glue in the rabbets (you can use a water-resistant yellow glue or polyurethane

glue) and drive in the deck screws. Then do the same for the bottom panel installation.

Next, cut the hang rail to fit into the carcass. A snug fit helps square up the box (Figure 2). Dry fit the rail and check the carcass for square, then drill countersunk pilot holes into the side panels and top. Remove the hang rail and spread glue on its top edge and ends before driving the screws. This rail will support the work center, so you want good strong joints here.

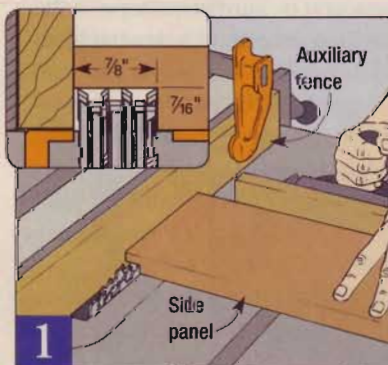
## What You'll Need

### Lumber

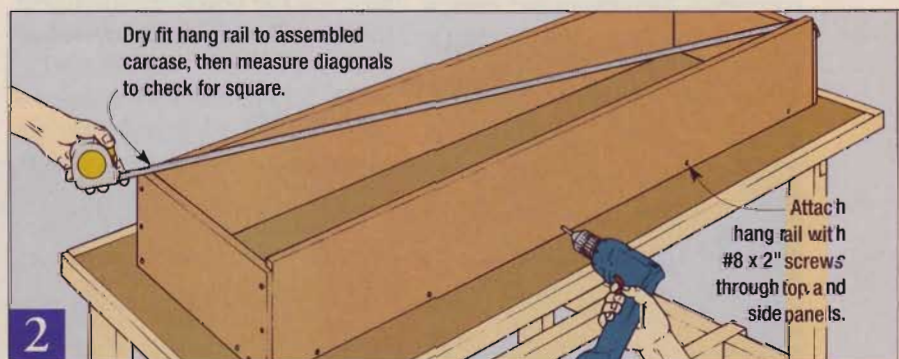
(40) lineal feet of 1x12 rough cedar

### Hardware

- (36) #8 x 2" flat-head wood screws
- (36) #8 x 1 1/4" flat-head wood screws
- (4) 1/2" x 1 1/4" screw eyes
- (3) 6" strap hinges
- (2) #3 double-loop chain, 24"-long
- (1) 2" gate hook-and-eye latch
- (12) adjustable shelf pins



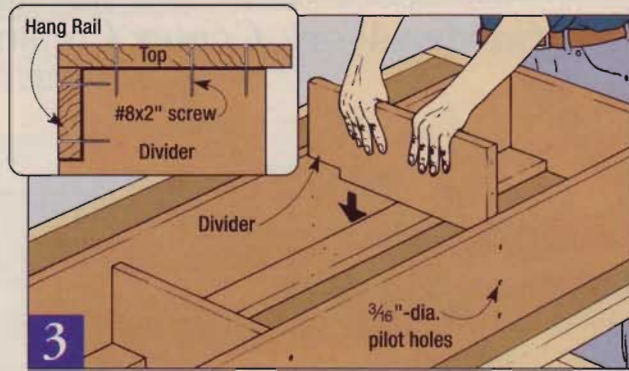
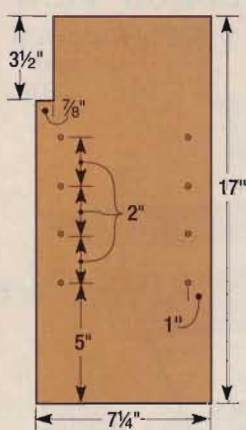
The 7/8"-wide rabbets in the side panels require two passes over a dado blade — one against the fence, the other offset.



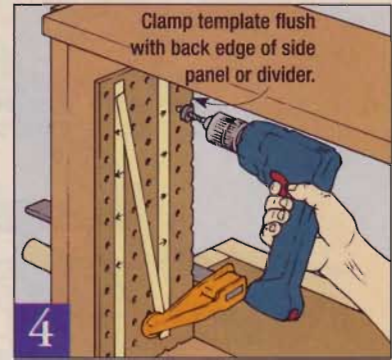
Assemble the top, bottom, and side panels using exterior-grade glue and #8 x 2" deck screws. Then measure diagonally across the carcass to check for square, and install the hang rail (be sure to glue and screw it to the side panels and top panel).



## Divider Detail



The dividers must be square to the top and bottom, and fit snugly around the hang rail. Check all this before drilling countersunk pilot holes through the top, bottom, and rail, and driving #8 x 2" screws.



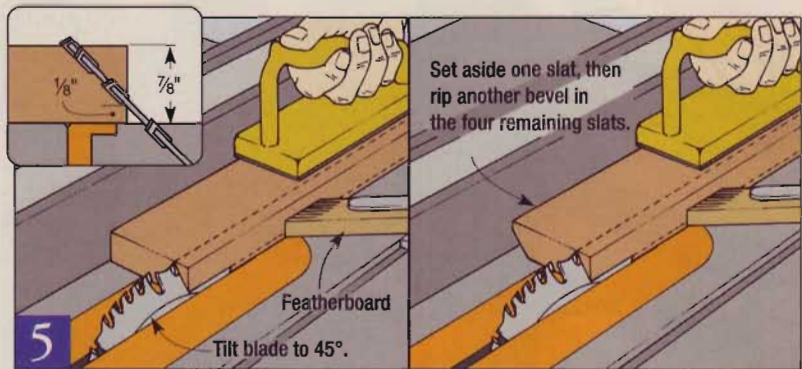
A pegboard template simplifies drilling the 1/4"-dia. x 3/8"-deep shelf support pin holes. Use a stop collar for insurance.

Installing the dividers splits the carcass into three equal compartments. They also add strength and, with the addition of 1/4"-diameter holes, accept the shelf support pins that hold the adjustable shelves.

Measure the inside height of the carcass to determine the length of the dividers. Take your measurement next to a side panel, in case the bottom panel is bowed a little. Cut two dividers to length and notch one corner of each piece to fit around the rail (**Divider Detail**).

Now dry fit the dividers. Make sure they're in position square to the carcass, then drill the countersunk pilot holes through the top, bottom, and hang rail (**Figure 3**). Drive a screw into each hole.

Bore holes for the shelf support pins in both faces of each divider and in the inside face of each side panel (**Figure 4**). Then set aside the drill and cut the shelves to size. I like to cut the shelves about 1/8" shorter than the width of the compartment. This allows for maneuvering the shelves when necessary.



To rip bevels, tilt your table saw blade 45° and set the rip fence 3/4" away from the blade. Bevel one edge on all five slats. Then, without changing the fence setup, bevel the other edges on four of the slats. Make sure both edges on each piece slope in the same direction.

## A Watershed Design

With the carcass completed, turn your attention to building the drop-front door. It's a simple assembly consisting of five slats held together by three braces (**Door Construction Details**).

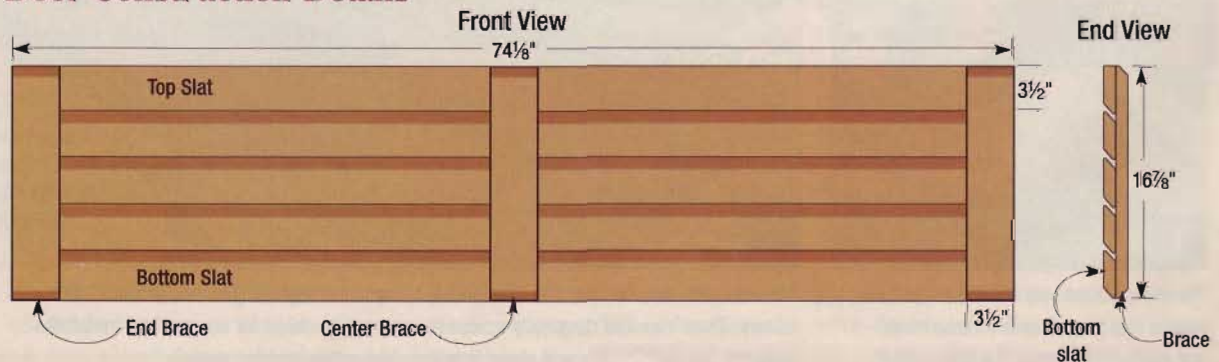
The slats all start out the same, so first rip five pieces to a width of 3 1/2", and cut them to length.

As I mentioned earlier, the key to the door's water-shedding ability is the bevel-edge design of the slats. The top slat is beveled on

one edge only; the rest have bevels on both edges.

Cutting a full bevel along the slats' edges would have left sharp, fragile corners, so I cut a partial bevel, leaving a shoulder about 1/8"-wide (**Figure 5**). Setup your table saw, then bevel one edge of each slat. Set one piece aside for use as the top slat, and bevel the other edge of the four remaining slats. A featherboard helps get smoother cuts, and be sure to use a push-stick anytime your hand nears the blade.

## Door Construction Details





The length of the three braces matches the length of the dividers, minus  $\frac{1}{8}$ " for clearance ( $16\frac{7}{8}$ " in my case). Cut the braces to length and bevel their ends at  $45^\circ$ , leaving a  $\frac{1}{8}$ "-wide shoulder like you did on the slats.

### Installing Hinges

At first, I planned to assemble the door at this point, then mount strap hinges to the door's face. But I realized if I followed this path, a paltry three screws in each hinge would have to carry the load, which could be substantial when the door's laden with pots and bags of soil.

To get all the screws to contribute to the cause, I sandwiched the hinges between the braces and the bottom slat (**Hinge Details**). Since I wanted the bottom slat to sit flush with the other slats, I recessed an area in each brace for the hinge flap to rest in.

Center a hinge on each brace and trace around the flap (**Figure 7**). Next, use your router and a

$\frac{1}{4}$ "-diameter straight bit to rout a recess in the outlined area (**Figure 8**). Set the bit depth to match the thickness of the hinge flap. Don't worry about shaping the recess exactly, but do rout to the outline or a little beyond. The recesses will be completely covered by the bottom slat.

### Assembling the Door

Correctly orienting the bevels on the slats is critical to the door's ability to keep rain from running into the work center. So as you assemble your door, pay close attention when positioning the slats.

After screwing a hinge to each brace, I found that attaching the top slat (the slat with only one beveled edge) to the braces is the best way to begin the door assembly (**Figure 9**). Align the square edge of the top slat flush with the ends of the braces, and drill two countersunk pilot holes at each crossover joint location. Drive a deck screw into each pilot hole.

Now fasten one of the double-beveled slats with its bottom edge flush with the bottom ends of the braces. Make sure the bevels on this slat are oriented the same way as the bevel on the top slat. Drill four countersunk holes in the slat where it intersects each brace (spacing them to miss the hinges) and drive the screws (**Hinge Details**).


Space the remaining slats equally, and drill two pilot holes at each crossover with the braces. Then drive the screws.

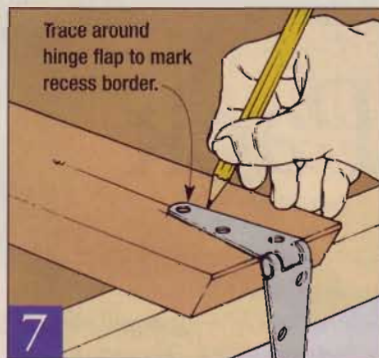
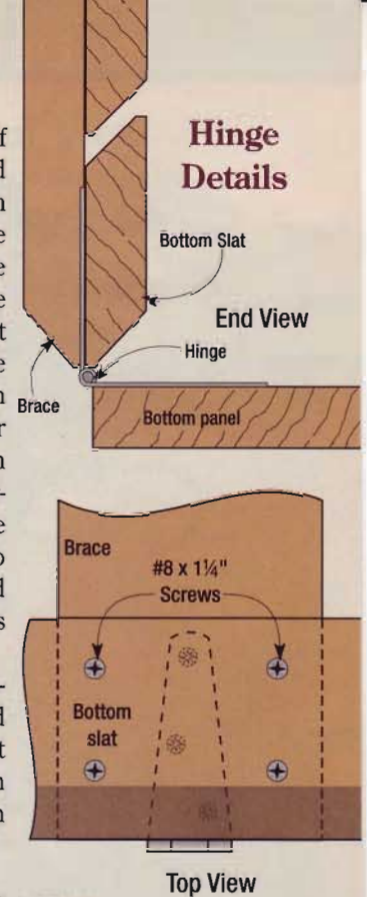
### Door Meets Carcase

Bring the subassemblies together by centering the door on the carcase and drilling pilot holes in the bottom panel for the hinge screws. Unlike the door hinge flaps, these flaps are just surface mounted.

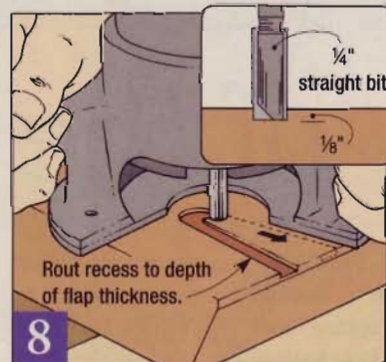
Supporting the door in the open position is handled by two light-duty chains. Drive screw eyes into one slat and attach one end of the chains (see below). Hold the door level and pull the chains taut under the top panel to locate another set of screw eyes. Drive them in, and attach the chains. Installing a gate hook and eye will hold the door shut.

I mounted the work center to the shed wall by driving 3"-long screws through the hang rail into the studs.

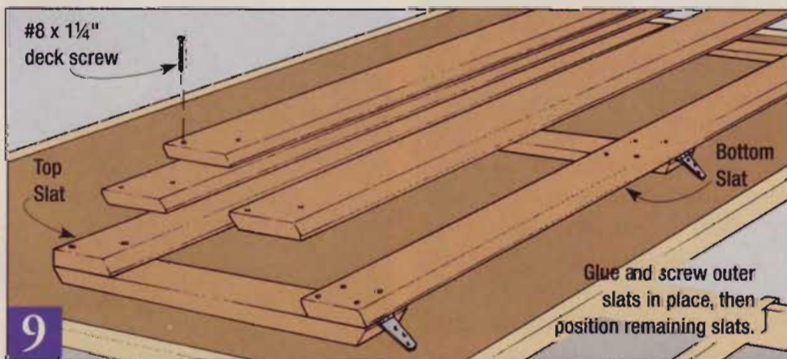
My future as a plant-man may be up in the air. But no matter how it goes, I know I have a work area that's sure to be admired by real gardeners everywhere. 



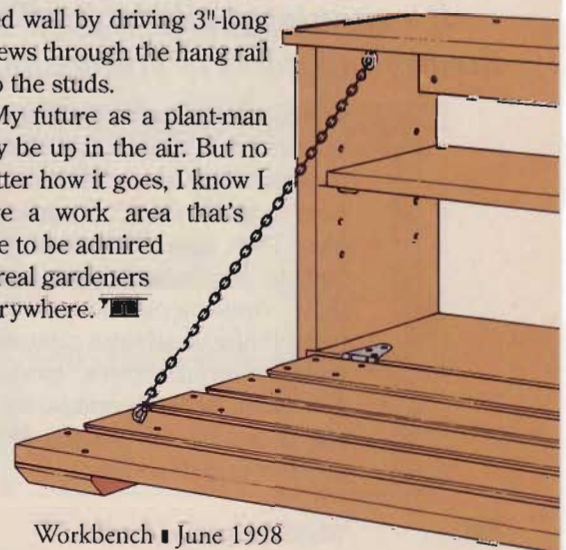
Center a hinge on the face of each brace, and butt the hinge knuckle against the bevel. Then trace around the flap.



Use a  $\frac{1}{4}$ " straight bit to rout the hinge flap recesses. Rout just beyond the outline, to a depth that equals the hinge flap thickness.



Attach the top slat first, then the bottom slat (be sure the outboard edges are flush with the ends of the braces). Position the remaining slats so that all the gaps are equal.







# Leaders of the Pack

*Besides a trusted hammer and a tape measure, the most indispensable tool a carpenter owns is a heavy-duty circular saw. It's what turns piles of framing lumber and stacks of plywood into*

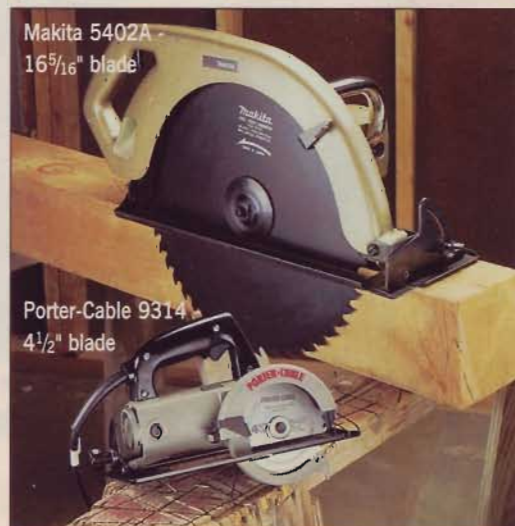
a finished structure. These saws will rip, bevel, and crosscut. Install the appropriate blade, and they can even tackle concrete, tile, or metal pipe. Then again, these saws are built to handle such jobs, unlike their consumer-grade counterparts. Professional saws come with more powerful motors, stronger gearboxes, better bearings, and a raft of options not typically found on lower-priced models.

Whether you're buying your first circular saw or looking to replace one, it's worth taking a close look at the models the pros use, particularly when you consider their combination of power, versatility, and durability.

## The 7<sup>1</sup>/<sub>4</sub>" Standard

Circular saws come in a variety of sizes, designated by their blade diameter. They range from 3<sup>3</sup>/<sub>8</sub>" cordless trim saws to 16" or larger giants used in timber frame construction. By far the most common size is 7<sup>1</sup>/<sub>4</sub>". Using a blade this diameter allows the saw to remain fairly compact, yet provides plenty of bite to power through 2x stock with the blade laid over at 45°.

Most manufacturers also offer smaller, easier-to-handle versions — 5<sup>1</sup>/<sub>2</sub>" to 6<sup>1</sup>/<sub>2</sub>" — that will still cut 2x material at 90°. Though not as powerful, these scaled-down models are typically the saws of choice among finish carpenters.





### Worm-drive Power

Circular saws come in two basic "flavors" — worm-drive and sidewinder — based on the motor position and type of gearing.

Worm-drive saws have motors positioned parallel to the blade, and use a worm gear transmission to power the blade. These deep-meshing gears, such as those in the Skil HD77 (below), produce a blade speed of about 4,400 rpm (compared to 5,800 rpm for helical-gear saws). However, this slower speed is more than offset by an increase in torque. Using a similar transmission with hypoid gears (below), Makita claims its longer, spiral-cut gears mesh more smoothly and positively than conventional worm

gears. Whatever the hypoid's advantages, other manufacturers haven't seen fit to give up the proven performance and durability of worm gear transmissions.

To further boost performance, a sealed oil reservoir gives the gears and bearings a continuous bath of lubricant, reducing wear and dissipating heat. As a result, worm-drive saws can gang-cut plywood or framing lumber without bogging down or stripping out a gear.

I first experienced this raw power buzzing through sopping wet, pressure-treated deck lumber with a borrowed worm-drive. (My old saw had already died trying to cut this soggy stuff.) I also remember how my wrist and forearm ached after 10 hours of hoisting that beast into cutting position.

These saws typically weigh 15 to 18 lbs., making overhead cuts an

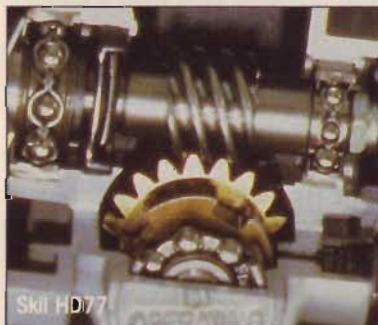
impractical and often painful experience. But skilled framers use this weight to their advantage by propping up 2x material on edge, and making crosscuts vertically, letting gravity help pull the saw down through the board.

Because the motor configuration puts the handle further back, I also find a worm-drive saw extends my reach when cutting a sheet of plywood. That long rear handle, combined with having the blade on the left side, also makes it easier for right-handers like me to eyeball straight cuts.

### Sidewinder Speed

The other main type of saw has the motor mounted perpendicular, or sideways, to the blade. Hence its nickname, sidewinder. Top-end models use spiral-cut helical gears (lower left) to transfer the rotation

### Worm Gear Assembly



### Hypoid Gear Assembly



### Helical Gear Assembly



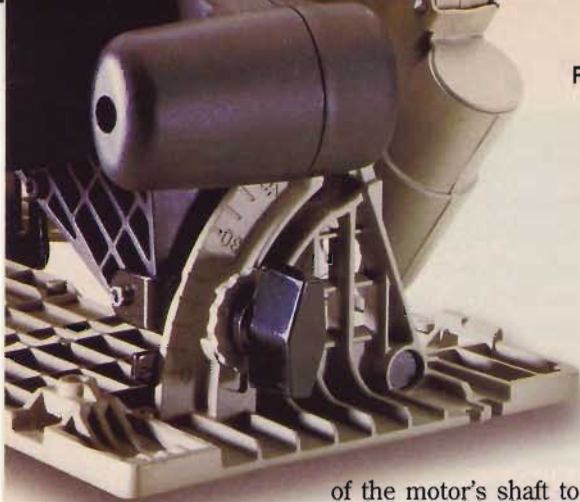
## Cordless Saws: Lightweight and Mobile

In addition to drill/drivers, the recent boom in cordless tools has included circular saws. Increases in voltage and battery output have made it more feasible to create cordless saws, and a number are now available in 12- to 18-volt models. However, these saws are no substitute for their corded counterparts when it comes to large-scale or continuous cutting — they don't have the power or cutting capacity to compete.

These tools shine in applications where a heavier corded tool is too awkward or power isn't readily available. DeWalt's line of cordless saws all use 5<sup>3</sup>/<sub>8</sub>"-diameter blades and weigh in at less than 8-lbs. These left-bladed trim saws will easily cut 2x material at 90°, but weren't designed to make one-pass bevel-cuts in that lumber when tilted to 45°.

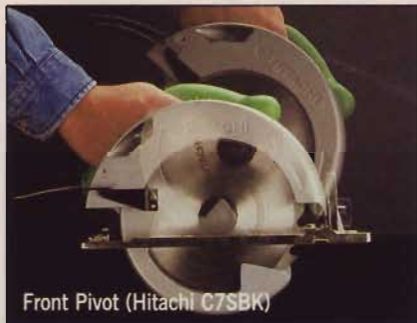
Makita offers 9.6-volt and 12-volt saws with 3<sup>3</sup>/<sub>8</sub>" blades, while Panasonic carries two 12-volt models in 4<sup>3</sup>/<sub>8</sub>" and 5<sup>3</sup>/<sub>8</sub>" sizes. Skil offers a 12-volt, 3<sup>3</sup>/<sub>8</sub>" model equipped with a diamond-tipped blade and a water bottle — it's designed specifically for wet-cutting glass and tile.





of the motor's shaft to the blade driveshaft. While lacking the worm-gear torque, these gears allow higher speeds that in turn can produce smoother cuts.

Most sidewinders have the blade on the right, although Porter-Cable offers left-bladed versions of its framer's saw. Despite the fact that having the blade on the right makes it hard for right-handers to view the cut, I'm willing to overlook this shortcoming



Front Pivot (Hitachi C7SBK)



Rear Pivot (DeWalt DW384)



Drop-foot (Milwaukee 6375-20)

because the saw is easier on my arm — sidewinders tip the scales in the 10- to 13-lb. range. And when I trim the end of a board, most of the saw's baseplate (and weight) rests on the workpiece. However, this wide base — the result of the sideways mounted motor — can sometimes get in the way when you need to make a cut in a cramped location.

From a cost standpoint, you can generally expect to pay more for a worm-drive saw than a sidewinder. Worm-drive saws start at about \$150 and go up to \$200, while contractor-grade sidewinders sell for roughly \$120-\$180.

### Pivot points

Regardless of the type, you should look for several things in a circular saw. You want one with a strong, flat base. Stamped steel base shoes are more prone to bending and flexing because they lack the reinforcing ribs found on cast aluminum or magnesium bases (shown on the saw at upper left).

Blade height and bevel adjustments should operate smoothly, but lock firmly. The blade height adjustment you'll find on most saws consists of a fixed pivot point on the front of the saw and an arch-shaped guide at the rear.

An exception are two rear-pivoting models offered by DeWalt (center). To raise or lower the blade, you loosen the front handle knob and the saw pivots around a point at the rear of the base.

A third type of mount — the drop foot — doesn't have a pivot point. Instead, the saw rides on a vertical rail system. Milwaukee has used this design for years on its 6375-20 saw and earlier models.

For standard cutting, any type will do, but I have a preference when making plunge cuts. I like the smooth control I get with either of the pivoting styles. The drop-foot style has a tendency to bind and grab — something to avoid for this precise work.

All saws will tilt to 45° for bevel



cuts and many will go all the way to 50°, which is useful for rafter cuts in roof framing. Of those, several have locks at 45° so you don't accidentally slide past to 50°. A few will tilt 3° to 5° in the opposite direction — a neat feature if you need to back-bevel a piece of trim before scribing it to a wall.

### Other Considerations

Most high-end saws have a spindle lock, which makes changing blades a snap. The lock button should be easy to reach while holding the saw in one hand and loosening or tightening the arbor nut with your other hand. For added convenience, look for a model with on-board wrench storage in the handle, like the model shown above.

Some saws (below) have levers that let you retract the blade guard. This feature keeps your hands away from the outside of the blade guard and increases your control during the cut.

I'd also recommend a saw with an electric blade brake. This stops the blade in a fraction of a second after you release the power switch — a particularly nice feature if you consider the blade is exposed





when the blade guard retracts during a cut. Many manufacturers offer a brake-equipped version of most models for \$10 to \$20 more.

My next saw will also have soft-start. This feature lets the motor slowly come up to speed, greatly reducing the wrist-wrenching torque generated by a powerful motor snapping to full speed when you pull the trigger switch.


One key feature many buyers overlook is the cord. I want a cord that remains pliable in cold weather, and that's at least 8-ft. long to give me room to move around. Several companies offer optional plugs with twist-lock prongs. They lock together with mating twist-lock extension cords or outlets, so they won't come loose when you tug on the cord.

### Which to Choose?

So which saw is best? Both and neither. Professional framers have used both types for years, so it depends less on what you need it to do, and more on just plain personal preference (see *A Tale of Two Saws* on page 72).

A quick poll of *Workbench* staffers showed that most own both types (or would if we could). Then again, we're all tool fanatics. But in trying to justify owning both saws, I heard some common threads of wisdom. If there's a job that requires high torque — gang cutting treated lumber or sawing out concrete or masonry — we all reach for a worm-drive saw.

For trimming sheet goods or making cuts that require lifting the saw over waist high, we'll grab the sidewinder. After that, it turned into a heated debate related to brand loyalty and ambidexterity.

Suffice it to say that for most home woodworkers, any of these pro saws will meet your needs and last a lifetime. If you can, visit a building center and handle several models to get a feel for how they fit your hands. Find one that feels good, buy a good blade for it, and you're ready to rumble. 

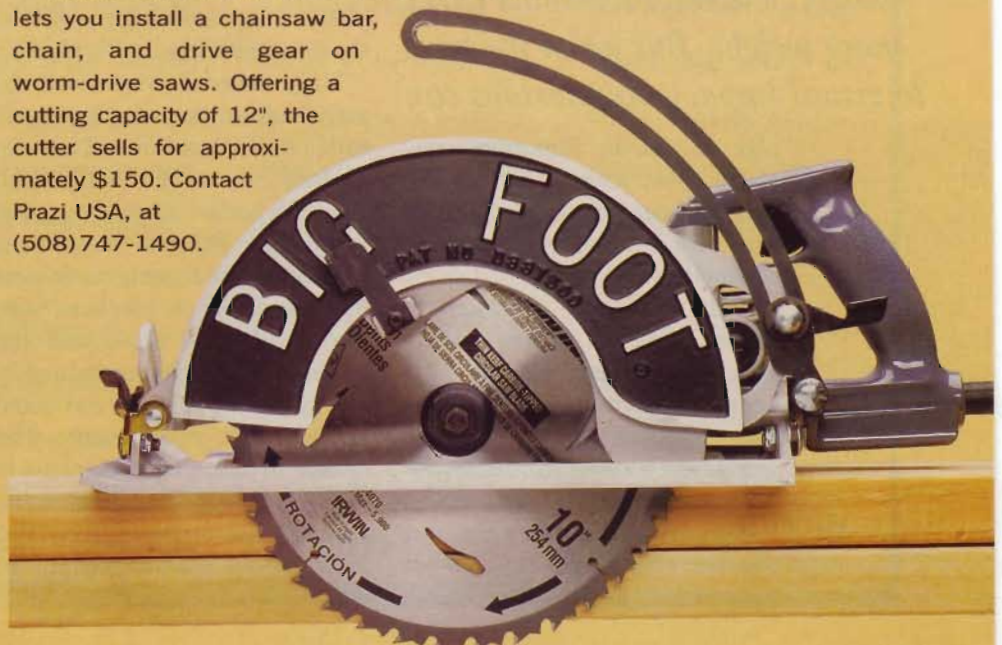
## Cutting Edge Accessories

Mount the proper type of blade in your circular saw and you can cut just about anything. For general purpose cutting in wood, a thin-kerf, carbide-tipped blade of 20 or 24 teeth (for a 7<sup>1</sup>/<sub>4</sub>"-diameter saw) is hard to beat. Many of these blades have expansion slots to dissipate heat, some have non-stick coatings, and a few, such as Freud's Diablo series have a raised area behind the cutting tooth that helps prevent kickback. Remodeler-type blades, such as DeWalt's Rock Carbide Extreme blade, have 14 to 18 teeth, and can cut through nails and fasteners without throwing a tooth or diminishing the blade's cutting ability.

If you need to cut masonry, concrete or stone, you can equip your saw with a dry-cut diamond blade. While expensive (\$50-\$80), these blades have grit along the edge of the blade and last much longer than the solid abrasive grit blades. For cutting ferrous metals such as steel bar stock, Irwin's Metal Star and Vermont American's new Steel Cutter blades are carbide-tipped alternatives to aluminum-oxide cutoff wheels.

Need to cut larger material? If so, you have a couple ways to boost the capacity of your 7<sup>1</sup>/<sub>4</sub>" saw. The Big Foot Saw Adapter converts your worm-drive saw to handle a 10"-diameter blade, giving you the capacity to gang-cut two layers of 2x stock or slice through a 4x4 in one pass. Consisting of a blade guard housing and baseplate, the 10" kit, complete with blade, is under \$200. For information, call Big Foot Saw Adapters, (702) 565-9954.

Another extra-depth option is the Prazi Beam Cutter, an adapter kit that lets you install a chainsaw bar, chain, and drive gear on worm-drive saws. Offering a cutting capacity of 12", the cutter sells for approximately \$150. Contact Prazi USA, at (508) 747-1490.







# Install A Countertop

*New cabinets have a powerful effect on a kitchen remodeling project. In terms of layout and budget, few improvements carry more weight. But when it comes to visual impact, countertops can*

play an equally important role. Using color, texture, and edging details, countertops easily hold their own alongside vast expanses of cabinetry.

With a rainbow of colors to choose from, not to mention the variety of materials available, it's a sure bet you can get the unique look you want. And, if you're searching for ways to revitalize your kitchen without financing a second mortgage, paint and new countertops may offer the adrenaline boost your tired old decor needs.

In our case, we added custom countertops to the new Merillat cabinets we installed recently in contributing editor Bob Settich's kitchen. (We chronicled that first phase of our remodeling project in the April 1998 issue of *Workbench*.)

Many materials were ruled out early because they simply weren't within the budget Bob and his wife Barbara had set for the project. What the budget allowed was plastic laminate covered countertops. Bob considered going to a local building center to purchase post-formed units — those with the backsplash and edging formed in one piece — but in the end opted for site-built countertops. The chance to pick a laminate and add edging of their choice was a big factor in the decision. They also liked the idea of a seamless corner — a feature I'll explain later.

They selected laminate (4556-60 Scopia) for the counter surfaces, and picked a backsplash (SS profile) and edging (SE style), all from Wilsonart. The edging and backsplash have a thin accent stripe that breaks up the expanse of the counters. (For more options, turn to *Six Easy Edging Ideas* on page 52.)

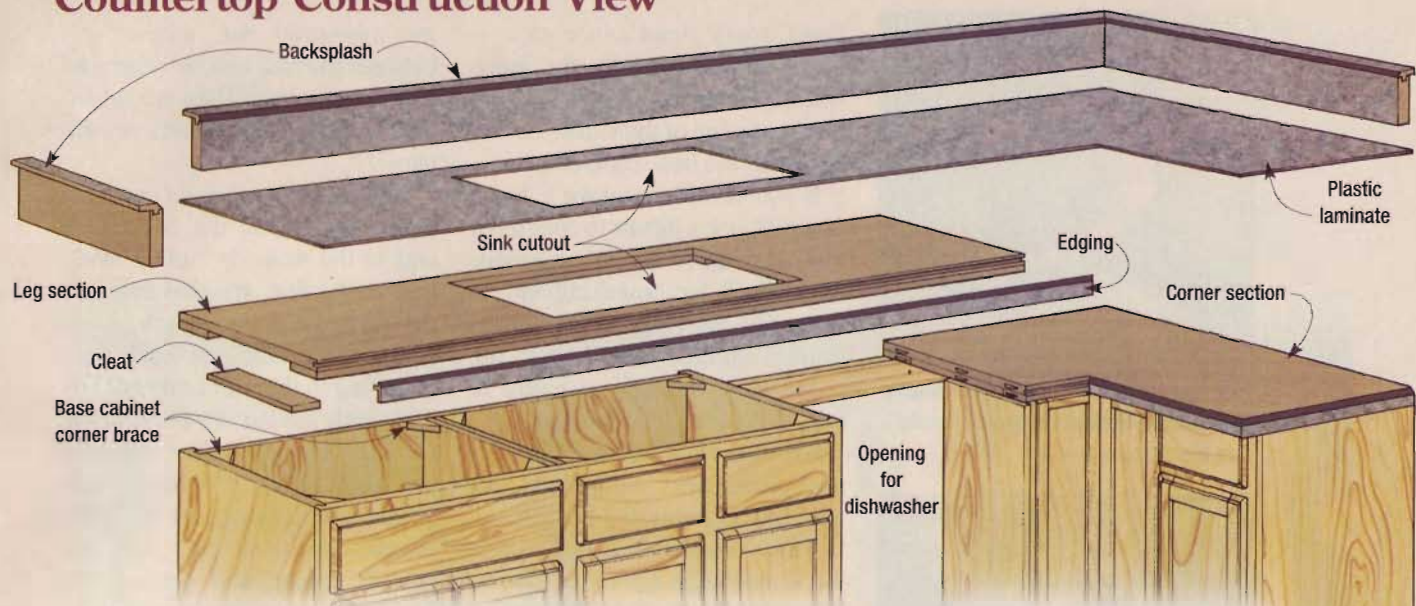
## **Making it Seamless**

Once the Settichs made their decisions, we went to work. The first thing we did was order Medex for the base layer, or substrate. Medex is a water-resistant version of medium-density fiberboard (MDF). It's stable, smooth, and flat, and we found it easy to trim, despite the clouds of fine dust that billow up when you machine it.

Creating invisible seams with laminate is difficult, and often seams become glaringly obvious



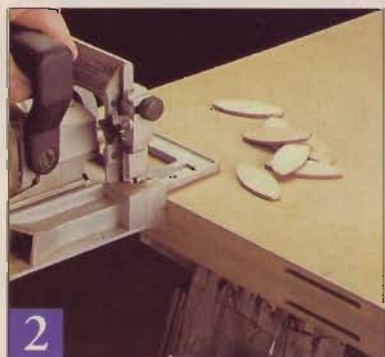
## Countertop Construction View



over time as water seeps in from repeated washings. So we also ordered a sheet of laminate 5 ft.-wide by 12 ft.-long that let us cover our L-shaped counter with one piece (**Countertop Construction View**). The leftover piece was used on a small auxiliary countertop.



**1** Build up the substrate edge thickness by gluing 4"-wide cleats of Medex to the bottom sides of the countertop substrate.



**2** Building an 11 ft. long countertop from standard 4 ft. x 8 ft. materials required us to splice the substrate using biscuits.

To fashion the countertop substrate from standard 4 ft. x 8 ft. sheets of Medex, we cut the corner as one section and butt-joined the leg piece to one end. This ensured the corner piece remained flat, and, given the heft of Medex, this two-piece assembly made the countertop easier to handle.

We built up the thickness of the edges wherever necessary by gluing 4"-wide cleats to the underside of the substrate (**Figure 1**). This assured that the countertops would contact all base cabinet walls to provide adequate support.

I recommend cutting the leg section 2" longer than its finished length to allow for final fitting. And I feel strongly that reinforcing the butt joint with biscuits makes good sense (**Figure 2**). (But hold off gluing the joint together for now.)



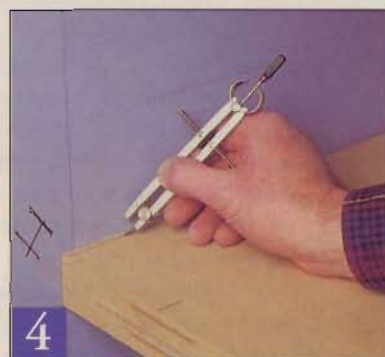
**3** The edge of the substrate must be parallel to the face of the base cabinets to ensure a uniform overhang.

### Scribing the Fit

Fitting a countertop is a multi-step process that requires accurate measuring and marking. To be successful, you must reference the substrate to the front edge of the base cabinets so you have the same amount of overhang at all points. At the same time, you want a close fit against the walls.

Lay a section of substrate atop the cabinets, and establish the overhang from the face of the base cabinet (**Figure 3**). We began with the corner section since it had to fit against two walls (which happened to be slightly out of square).

After aligning the substrate with the base cabinet, we found the point where the substrate and wall were farthest apart, and set a compass to that distance. Then we scribed the substrate (**Figure 4**).



**4** Once the substrate is aligned parallel with the front of the cabinets, scribe the back edge to the wall using a compass.





Use a jig saw to cut the substrate roughly to your scribe line, keeping to the waste side of the scribe line.



Complete the trimming to the scribe line using a belt sander. Tilt the sander slightly to undercut the edge for a better fit.

Don't worry about minor gaps — they'll be covered by the backsplash. The main concern is to get the front edge of the substrate parallel with the base cabinet faces.

If you need to remove a lot of material, use a jigsaw to rough out the cut (Figure 5). A belt sander works well for "sneaking up" to the scribe line (Figure 6). Tilt the sander slightly to undercut the edge. This will make it easier to adjust the fit against the wall.

Satisfied with the fit of the corner piece, next we turned our attention to fitting the leg section. In Bob's kitchen, the end of this piece also butts against a wall, so we couldn't just cut it to length; we also had to scribe the end for a tight fit.

First, we laid the leg on top of the base cabinets and corner section, butted its end against the wall, and established the uniform overhang. Then we measured the amount the leg overlapped the corner section at the butt-joint. After writing this measurement down,

we measured the widest gap between the wall and the other end of the substrate. Then we added the gap and overlap measurements plus  $\frac{1}{8}$ ".

Using this sum, we set our compass and scribed the substrate's end to the wall. By cutting along this scribe line, we also trimmed the leg to the proper length.

Accurately fitting the back edge of the leg to the wall could only be done with the leg dry-fitted to the corner piece (with biscuits installed). Bob and I slid the substrate assembly against the wall, checked the alignment with the cabinet fronts, and scribed the back edge of the leg.

Once the back edge was trimmed to shape, we slid it back into place to check the fit.

When you're satisfied with the fit, remove the substrate sections and place them upside down on a flat surface. Squirt glue into the biscuit slots and run a bead along the ends to be joined, then clamp the assembly together (Figure 7).

## Post-Formed Countertop Simplifies the Process

Post-formed countertop is readily available and simplifies installation since the laminate is already applied and the backsplash and edging are integral parts. The key, as with any countertop, is to make sure the countertop aligns parallel to the front face of the base cabinets before you scribe it to the wall. A lip on the rear edge of the backsplash allows you to easily trim up to  $\frac{1}{4}$ " when fitting it to the wall.

When you cut post-formed countertop, use a fine-toothed crosscut blade and saw through the backsplash first. Then clamp a board to the bottom of the substrate to hold your saw flush with the edging cleat and guide the blade as you make your cut.

You can order pre-mitered pieces to make right-angle turns. A bead of silicone sealant and drawbolts are used to join the two pieces, making the mitered joint tight and flush.



After aligning the front edge with the cabinets, scribe the backsplash to the wall with a compass.



To cut a post-formed countertop, begin by sawing through the backsplash with a fine-toothed blade.



A guide clamped to the underside puts the saw flush with the edging lip and controls the cut.



After applying a bead of silicone caulk, use drawbolts to pull the countertop joint tightly together.



In a few hours, turn the substrate over and scrape off any squeeze-out. If necessary, apply wood filler to any low spots, and sand it smooth.

### Laying the Laminate

Our laminate arrived a couple of weeks after we ordered it and came loosely rolled up in a cardboard carton. I carefully unfurled it the day before we planned to attach it, laying it flat to remove any “memory” of being curled.

When laminating large pieces, I allow at least two inches of overlap on all sides. This way, I have little risk of misaligning the laminate on the substrate once the contact cement is applied — errors here are tough to undo. (For details, read *Laying Laminates* in the December 1997 issue of *Workbench*.)

Apply two coats of contact cement to both the laminate and substrate, and use spacer sticks to hold the laminate above the substrate until you have it positioned. After removing the spacers, secure the bond by working over the entire surface with a roller. Trim the excess with a router and a flush-cut bit.

### Adding the Edging

Our edging had a tongue for mounting it to the substrate. The tongue fits in a groove that we had to rout in the appropriate edges of the substrate (**Figure 8**). Because this edging precisely overlaps the countertop laminate, the grooves had to be positioned with dead-on accuracy.

Using the special slot-cutting bit sold with the edging, we routed test grooves in scrap to set the router depth. Then we routed the grooves in the countertop.

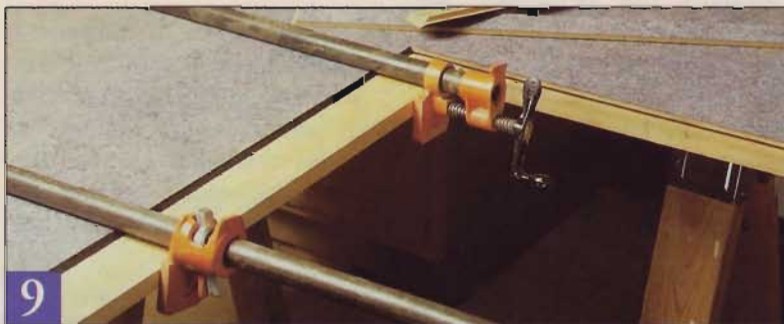
We cut all edging for the countertop a couple of inches long, and started our fitting process at the inside corner of the “L”. Once we had a tight-fitting miter there, we marked and mitered the opposite ends, then mitered mating pieces for the outside corners. We cut these last pieces to length so they butted against the walls. Apply water-resistant wood glue to the



7 Once it's trimmed to fit, place the substrate sections upside down on a level surface, then glue and clamp them together.



8 Using the slot cutting bit sold by the edging manufacturer, rout the edging mounting groove in the edge of the substrate.



9 After fitting the mitered ends of the edging, glue the long edging piece in place, using cauls to apply clamping pressure evenly. Then glue and clamp the remaining edging.



10 Install braces against the upper cabinets near the back edge and clamps along the front. These hold the countertop firmly in position until the construction adhesive dries.

edging, and clamp it firmly in place (**Figure 9**).

After checking the fit one last time, we applied construction adhesive to the top edges of the base cabinets and carefully set the countertop in place. Braces, wedges, and clamps held it firmly in place overnight (**Figure 10**).

Before removing the bracing, we drilled holes through the cabinet corner braces and drove screws into the substrate cleats (**Figure 11**).



11 Before you remove the bracing, drill pilot holes through the cabinet corner braces, and drive screws into the substrate cleats.



## Finishing Up

The only task remaining was to install the backsplash. Using a ready-made backsplash made this final step a simple process.

Since Bob's walls were somewhat out of square, we decided to cope the corners instead of miter them — it was actually easier and gave us tighter joints (Figure 12).

The long piece went in first, then we coped the short pieces to fit against it. Even though Bob planned to install a row of ceramic tile above the backsplash, we scribed and trimmed it to get good contact along the wall. We applied a thin bead of adhesive to the back and bottom edge of each backsplash piece, and pressed them into place (Figure 13). We took care to clean up the squeeze-out, and when



Miter the end of the backsplash, then use a coping saw to trim away the excess, following the edge of the laminate.



Install the longest piece of backsplash first, then install the coped piece against it. A bead of caulk wraps it up.

the adhesive set up, we caulked the seam with clear silicone.

While we wanted to stand back and admire our handiwork, Barbara reminded us that the kitchen still needed the sink and appliances installed. At least she

was willing to overlook the plywood underlayment on the floor — for the time being. We plan to wrap up that final phase of this kitchen remodeling project with laminated wood flooring. We'll be done soon, Barbara. We promise! 🏠

# Six Easy Edging Ideas

When we first looked at edging for the countertop going into Bob's kitchen, we were amazed at the number of options available commercially. We also found them easy to install and simple in their construction. And though we found the perfect manufactured edging for our project, we wondered how easy it would be to create our own shop-built versions.

So in a display of true do-it-yourself spirit, we rounded up some scraps of laminate and substrate from Bob's remodeling job and put together a few edging ideas of our own. We were also curious to see what our second edging choice — a black, solid acrylic commercial molding — looked like with our laminate, so we created a sample with it, too.

We routed a groove in the back edge of our moldings, as well as in the countertop substrate, to accept a wood spline. We also routed details in the front edge of some moldings, such as the groove for the brass or Corian inlay, before we installed it on the substrate. With the front details shaped, we glued the edging to the substrate. Then, we applied the laminate so it overlapped and bonded to the edging. Our final shaping on the front edge, whether a flush-cut, roundover, or chamfer, left us with a seamless transition between the edging and laminate.

You'll want to use a new, carbide-edged router bit with a guide bearing to do the final trimming. It also helps to hone your technique on scrap samples first before tackling the real thing.



Maple with Corian accent inset



Pine with store-bought dentil molding



Oak with brass inset



Mahogany with bowl bit routed profile



Red oak bullnose



Manufactured solid acrylic molding





# Mobile Planer Station

*It used to be that thickness planers were found only in professional cabinetry or millwork shops. But in recent years, a number of tool manufacturers have*

rolled out benchtop models that make it possible for home woodworkers to enjoy the benefits of surfacing their own lumber. Since I got mine, I now buy rough-sawn lumber that costs less and is higher quality than the surfaced lumber I used to buy. It's also great to be able to machine stock for a cab-

inet face frame or a panel glue-up and know that all the pieces are a uniform thickness.

While I'd be among the first to thank the tool companies for putting such capabilities within my grasp, I have a small bone of contention to pick with the marketing guys who attached the word "portable" to these machines. At 65 lbs., my planer doesn't get moved much further than from the shelf below my workbench to the benchtop. Even with the built-in handle, it's just too heavy to carry easily to project sites outside my shop, although there are times when I could use it.

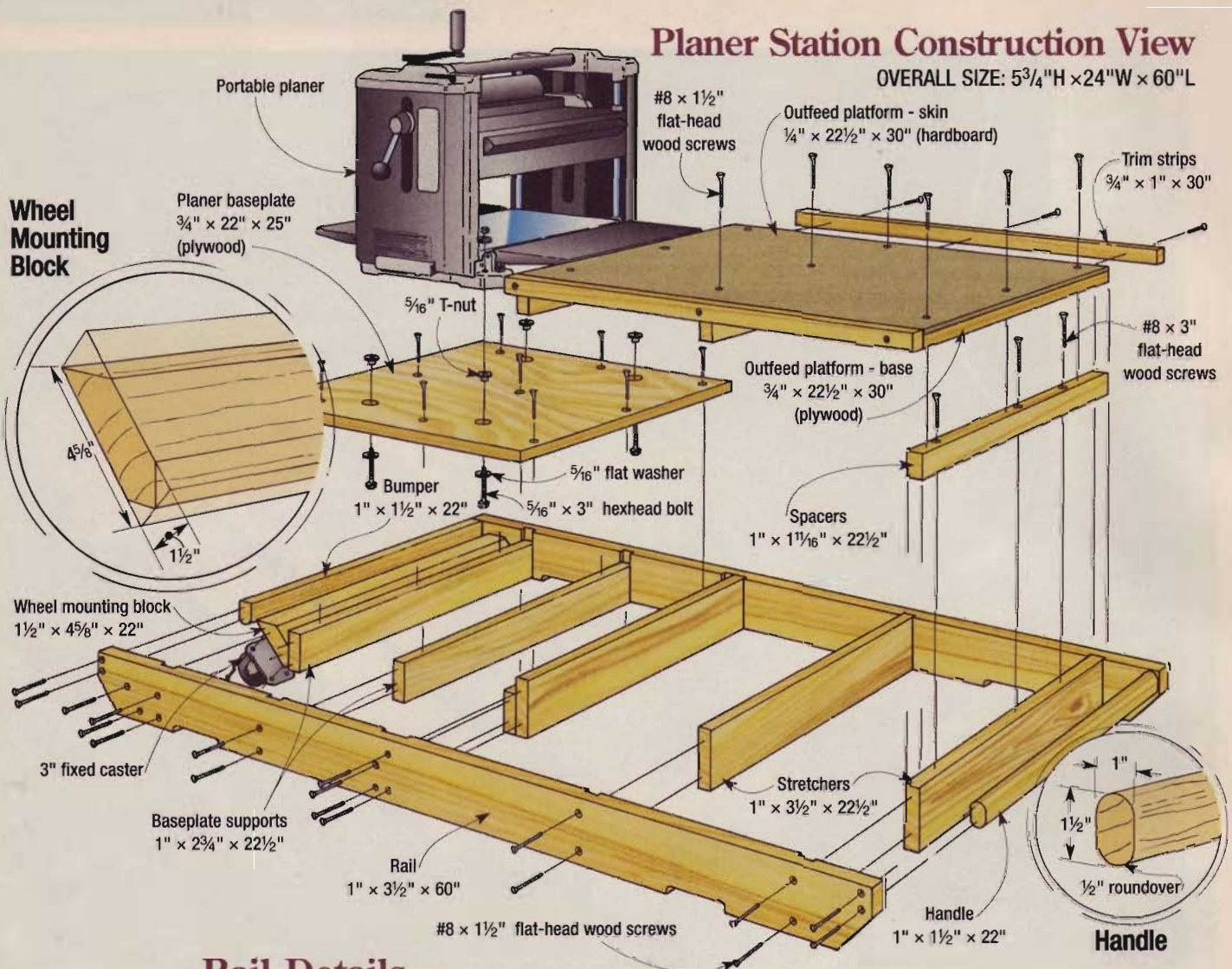
It took moving some heavy boxes with a two-wheeled hand truck to rattle loose the idea of mounting my planer to a two-wheeled frame. The frame I built is designed to span a pair of sawhorses to create a work station, much like the portable miter saw station and router table featured in the December 1997 and February 1998 issues of *Workbench*.

The hardboard-covered plywood platform effectively tripled the length of the planer's outfeed table, so long boards are supported after passing under the knives. This helps reduce snipe, and the slick surface of the hardboard lets the moving stock slide along easily.

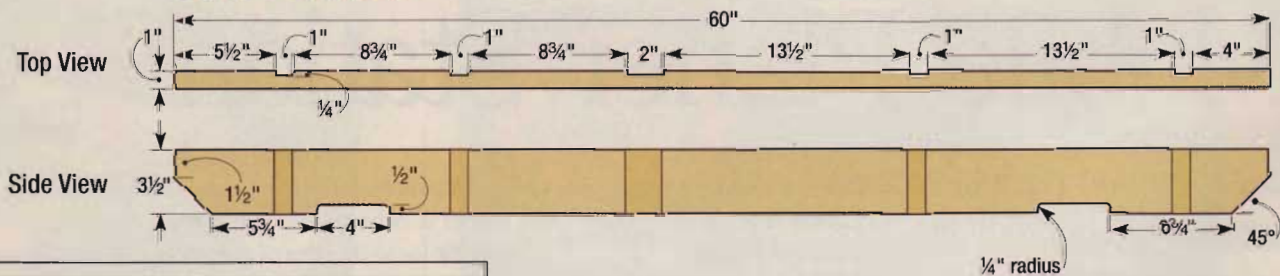


## Planer Station Construction View

OVERALL SIZE: 5<sup>3</sup>/<sub>4</sub>"H x 24"W x 60"L



### Rail Details



### What You'll Need

#### Lumber

- (1) half-sheet of 3/4" plywood
- (1) half-sheet of 1/4" hardboard
- (2) 10-ft. fir 2x10's

#### Hardware

- (2) 3"-diameter fixed casters
- (4) 5/16" T-nuts
- (4) 5/16" x 3" bolts with nuts
- (4) 5/16" flat washers
- (8) #10 x 1 1/2" pan-head sheet metal screws
- (64) #8 x 1 1/2" flat-head wood screws
- (9) #8 x 3" flat-head wood screws

The outfeed platform mounts to a trio of wood spacers attached to the frame structure (**Planer Station Construction View**). Varying the thickness of the spacers allows you to match the outfeed table height of most portable planers on the market (those with fixed beds and moving cutterheads like my Delta 22-560). It was also easier to trim a spacer than to adjust the thickness of an integral piece of the frame.

### Building the Frame

Because the whole purpose of the stand is to make the planer easier to move, keeping weight down was a major consideration. I chose 2x fir for its strength-to-weight ratio, but buying clear, straight-grained fir 2x4's proved impractical. However, I sorted through a stack of 2x10's and managed to find a couple with sections of relatively straight, knot-free wood.



To further reduce the weight and get square-edged, straight boards, I milled the wood to 1" thick (see *Re-milling 2x Stock To Square, One Side at a Time* on page 57).

Start by ripping the rails, stretchers, and baseplate supports to width, then cut them to length. Next, make the 45° cuts on both ends of the rails (**Rail Details**).

With the stock cut to size, clamp the rails together with the inside faces up (**Figure 1**). This helps with laying out matching dados for the stretchers and supports. Keep in mind that the middle dados are 2" wide because they each join with both a stretcher and support.

I cut the rail dados on the table saw with a 3/4" dado blade and a wood extension on my miter gauge (**Figure 2**). To cut each 1"-wide dado you'll need to make two passes. You can get consistent results if you clamp a 1/4"-thick setup block to the fence. Make the first pass after butting the rail against the setup block, and moving the fence to align the inboard side of a dado layout with the edge of the blade. Then, butt the end of the rail against the fence and make the second pass. As you setup for each dado, be sure to make the cuts in both rails.

Cutting the 2"-wide rail dados requires three passes. Using my layout lines, I cut the outside edges of the dados first, then removed the remaining piece of stock with the third pass.

It may seem like extra trouble to put rounded corners on the sawhorse notches, but I had a good

reason for doing it. Past experience has shown that if I cut the notches square, splits are more likely to begin at the inside corners.

Shape the notches in the rails by first drilling 1/2" holes — for the rounded corners (**Rail Details**). Then remove the stock between the holes with the dado blade raised to 1/2" (**Figure 3**). By lowering the blade to 1/4", you can remove the bit of stock at the ends of each notch.

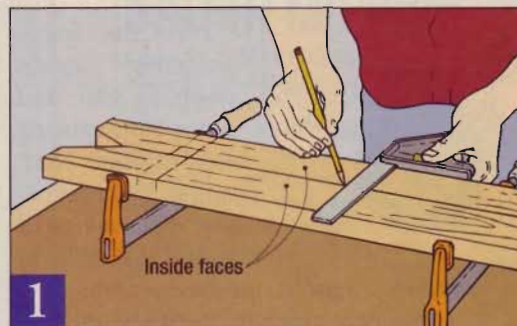
Now spread glue in the rail dados and clamp the frame assembly together. Check for square, then drive two screws into each joint.

Cut the 3/4" plywood baseplate to size, and screw it to the baseplate supports. As insurance against splitting and splinters, I sanded a slight roundover on all the outside edges of the frame assembly.

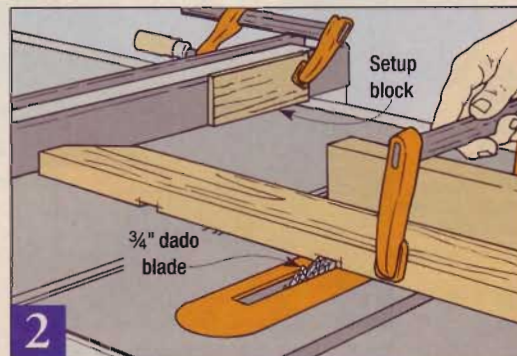
### Adding the Casters

Providing solid support for the wheels called for beefier stock, so I used a length of 2x6 for the mounting block. Rip a 45° bevel on one edge, mark and measure the width of the block, then bevel the other edge (**Figure 4**). An auxiliary wood fence helps keep the sharp edge of the bevel from slipping underneath the fence. I also use a push block when ripping bevels — to apply downward pressure and to keep my hand well away from the blade in case the workpiece binds between the fence and the blade.

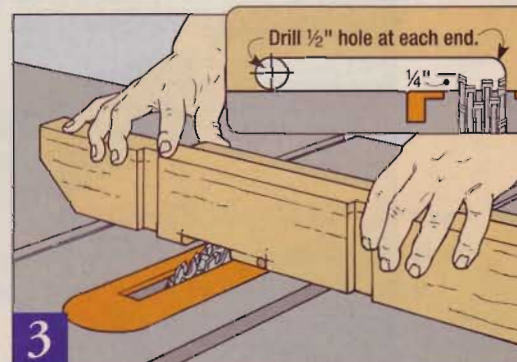
Lower the blade slightly, move the fence toward the blade 3/4", then flip the mounting block over, and cut a third bevel (**Figure 5**).



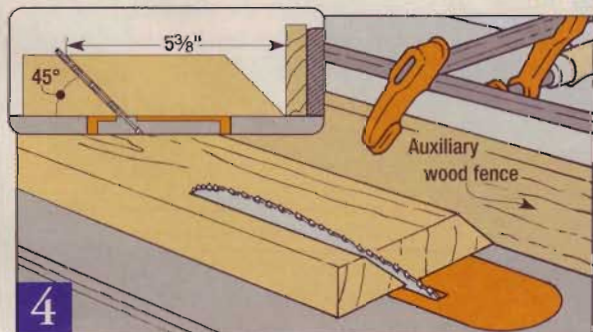
1 Insure a square frame by making the rails mirror each other. Clamp the rails together with the inside faces up, then lay out the dados. Unclamp the boards to mark the edges.



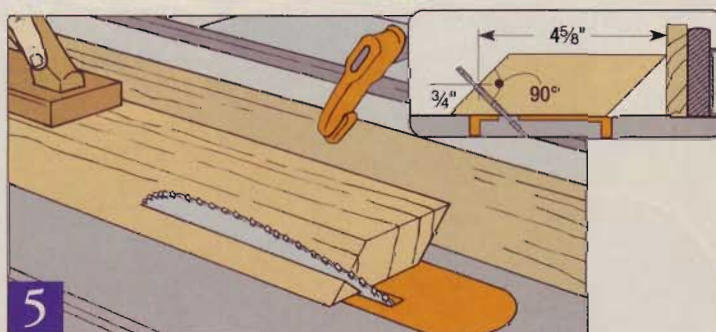
2 To prevent any movement during the cut, clamp the rail to the miter gauge. For the first pass, butt the rail end against the setup block. Use the fence to align the second pass.



3 With the dado raised 1/2", nibble away the waste between the 1/2"-dia. holes you drilled to define the notches. Then lower the blade and cut the wood below the holes.

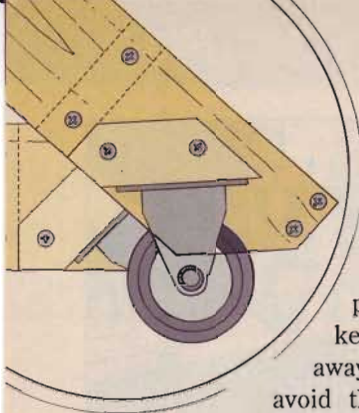


4 Begin making the wheel mounting block by beveling both edges of your stock. An auxiliary wood face prevents the beveled edge from slipping underneath the fence during the second cut.

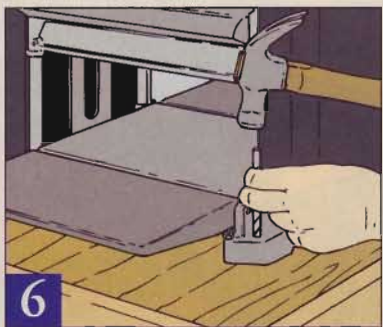


5 Complete the wheel mounting block by moving the fence toward the blade 3/4" and ripping a second bevel, which meets the first one right at the center of the block's edge. Finished width is 4 5/8".

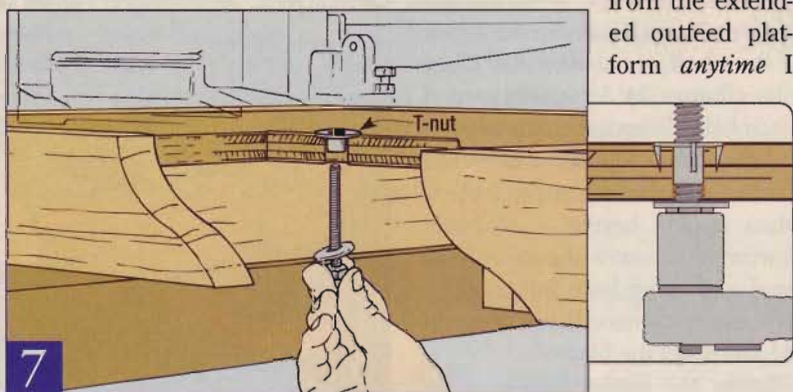




Turn the frame assembly upside down to glue and screw the mounting block in place. Next, position the casters, keeping them at least 2" away from the rails to avoid the screws you just drove through the rails into the ends of the mounting block. Mark the screw locations, drill pilot holes, then secure the casters.



**6** Insert a brad-point bit through the mounting holes in the planer base, and tap it to mark the hole locations on the baseplate.



**7** Tap a T-nut into the mounting holes in the baseplate. Slip a washer onto a hex-head bolt, and thread the bolt up from the bottom. Use a wrench to tighten the bolt and draw the T-nut flush with the surface of the baseplate.



**8** Use a level to check alignment of the planer's infeed and outfeed tables. Adjust them according to manufacturer's instructions.

After you mount the casters, cut the handle and bumper to size. Rout the edges with a 1/2" roundover bit, then screw the pieces to the frame assembly.

### Mounting the Planer

When I designed this project, I envisioned bolting the planer to this platform only when I needed to take it out of the shop. (I guess I still planned to store the planer in its "designated" spot under my workbench.) Plastic knobs were going to make mounting the planer a quick, tool-free operation.

Funny how reality can change your plans. As I slipped the machine onto the mounting bolts, I discovered that the planer's base didn't allow enough clearance to use wing-nuts, let alone plastic knobs. So much for quick, tool-free mounting.

But after using the station, I realized my original thinking was flawed anyway. By having the planer permanently mounted, I benefit

from the extended outfeed platform *anytime* I

use the machine. And the station can be propped against the wall of my shop when it's not needed.

To begin the mounting process, center the planer between the rails on the baseplate, and align the end of its outfeed table with the outfeed edge of the baseplate. Once I lined everything up, I inserted a 3/8" brad-point bit through each of the planer's mounting holes and gave it a tap to mark the hole positions (Figure 6). I removed the planer, drilled shallow 3/4"-dia. counterbores to seat the T-nut flanges, then switched to a 3/8" bit and drilled the bolt holes through the baseplate.

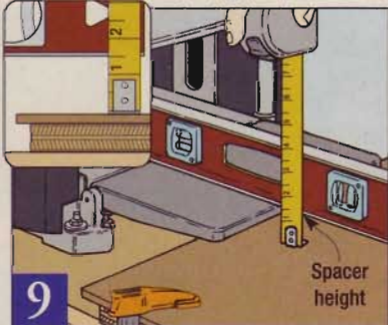
Install T-nuts in the baseplate by first tapping them into the holes with a hammer, then drawing them tight with a bolt (Figure 7). Slip the planer onto the bolts and add washers and nylon-insert locking nuts to the assembly — vibration may loosen standard nuts.

### Outfeed Platform

Now that you've mounted the planer, it's time to build the outfeed platform. But before you start, check to make sure your planer's infeed and outfeed tables are level with the bed. Follow the manufacturer's instructions for making these adjustments — Delta recommends using a level to fine-tune the 22-560's tables (Figure 8).

Once you have the tables set, cut the plywood and hardboard to size for the outfeed platform, and clamp the pieces in place on top of the frame assembly stretchers. Extend a level off the planer's outfeed table and measure the distance from the bottom of the level to the platform (Figure 9). Add 1/8" to this measurement and you'll have the thickness of the spacers you need, plus a little extra for final fitting.

Rip the spacers to this width and crosscut them to length. Position them on the stretchers and clamp the platform panels in place, making sure their ends butt against the planer's outfeed table. Lay a straightedge across the outfeed table and the platform to see how

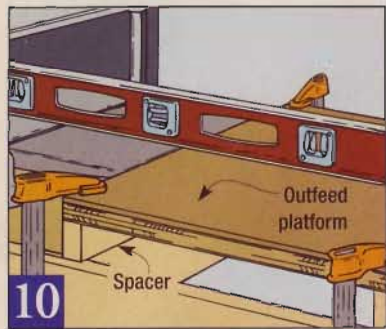


**9** Clamp the platform pieces in place, then measure between them and the outfeed table to determine spacer height.



much the spacers need to be trimmed (**Figure 10**). Run the spacers through the planer at the same time to trim them equally.

Drill countersunk pilot holes in the spacers and screw them to the



Place a straightedge across the planer outfeed table and platform to determine if the spacers are the correct height.

stretchers. Now you can reclamp the plywood and hardboard in place and drill countersunk pilot holes to screw the panels to the frame.

Since it's likely that the edges of the outfeed platform will get banged up, I added solid wood trim for protection. Cut fir trim strips to size and screw them to the edges of the platform.

### Finishing Up

A wipe-on oil-varnish finish and paste wax provide further protection for the planer station. Remove the planer, and mask the edges of the hardboard where it meets the trim strips. Then sand the entire station, except the hardboard, to 120-grit. Hardboard's exceptionally

slick surface doesn't require sanding or finishing. Apply two coats of varnish to the sanded areas, then give the entire station two coats of paste wax.

Wheeling the station to my pick-up for the first time was a pleasure. To load it, I simply leaned the handle end on the tailgate, then lifted the planer-end and slid the station into the truck bed.

Maneuvering the station onto the sawhorses is a similar two-step operation. First, I lift the planer-end onto a sawhorse, then I walk around to the handle-end, lift it, and slide the second sawhorse into position. You'll find, like I did, that moving and setting up your planer has never been so easy.

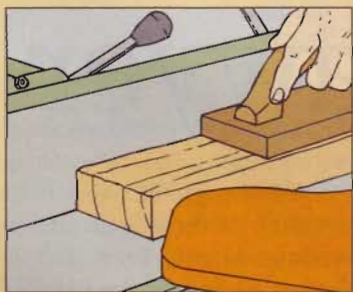
## Remilling 2x Stock To Square, One Side at a Time

I've used simpler methods and tools to mill lumber, but with the amount of woodworking I do it really pays to have machines dedicated to just that task. Now that I've complemented my 6" jointer with a benchtop planer, truing up stock is easy. I used the basic technique shown here to get the straight, flat boards I needed for the mobile planer station.

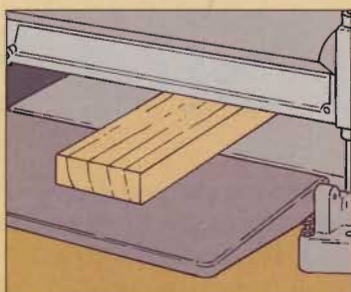
Begin by surfacing one face of the stock on your jointer. (This establishes the reference surface your planer needs to produce a flat board with parallel faces.) Take shallow cuts (under  $\frac{1}{16}$ " ) and joint one face flat in multiple passes. Then run the board, with the same face down, through the planer.

At this stage, it's unlikely that the board's edges are straight or square to the faces.

You can fix that by using a guide board to rip one edge straight on the table saw, or go back to the jointer for a few passes. After you machine one straight and square edge, you can rip the board close to final width. Then take a few finish passes on the jointer to remove the saw blade marks from each edge. If the board is thick enough (I consider  $\frac{3}{4}$ " the minimum) and not too wide, you can also run it on edge through your planer.



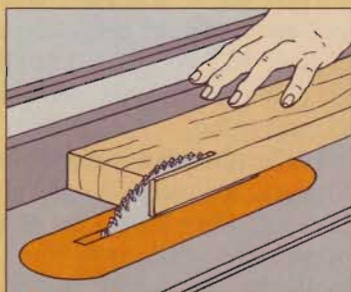
To get your first reference surface, mill one face of the board flat on the jointer. Keep the cupped face, if any, down.



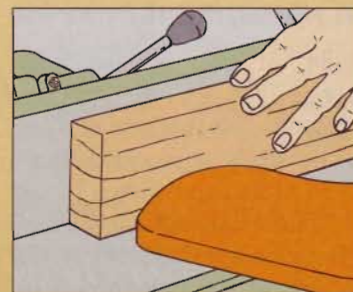
Next, send the board through the planer with the jointed face against the bed. Once flat, alternate faces for each pass.



Curved edges can be trued up with the table saw and a guide board. Or, for light edge-trimming, use the jointer.



With one edge now straight and square to the board faces, you can rip the workpiece close to its final width.



To remove saw marks, the finish passes on both edges should be made on the jointer or, if the size allows, the planer.





# The On-Site Sawyer

*The morning after a severe storm rolled through town, I went outside to inspect the trees in my backyard.*

*As I'd feared, the high winds had fatally damaged an ancient black walnut, uprooting it from the*

ground. At least it missed the house as it fell.

I hated to lose that beautiful tree and the shade it provided. But I have to admit that I'd often looked at its long trunk and imagined all the beautiful boards hidden inside. The fork of the tree, especially, showed promise of the exceptional figured crotch wood sometimes found in walnut trees.

## **In Search of a Sawyer**

With help from some friends and a few chainsaws, I separated the firewood from the parts of the fallen giant worth saving. I kept one large diameter limb, and cut the trunk into two 9-ft. long sections.

There was no way I'd be able to load and haul these heavy logs to a sawmill. So I decided if I couldn't get to the mill, the mill would have to come to me.

I called the folks at Wood-Mizer Products, a portable sawmill manufacturer. They keep a list of mill owners who will come to your site to do custom cutting. (Another portable mill maker, TimberKing, also maintains a nationwide list of sawyers for hire.)

Even though I'd seen demonstrations of these mills at woodworking shows, I couldn't help feeling excited by the thought of getting closer to this kind of machinery (and the hope that I'd get to take some of this serious horsepower for a spin). So I was really geared up when Burl, the appropriately named sawyer from Wood-Mizer, arrived at my house with the big orange beast in tow.

As we unhitched Burl's top-of-the-line LT-40 mill, we talked about its features (I could just imagine Tim Allen grunting his approval over each one). Like all Wood-Mizer mills, the LT-40 has a horizontal band saw that rides over a bed equipped with log hold-downs.



Power comes from either a gasoline, a turbo-charged diesel engine, or an electric motor. The engine powers the saw, a 12-volt hydraulic pump, and a generator that keeps the battery charged and runs several small electric motors. These motors position the cutting head and move the saw along the log bed.

Getting the mill ready to run was surprisingly simple: adjusting five legs that level the cutting bed and support the mill when loaded with heavy logs. Turning the ignition key brought the 35-hp engine to life.

### Loading the Log

While the engine warmed up, we rolled a log to the mill using logger's cant hooks — without them we wouldn't have budged the beast (**Figure 1**). As the log turned, Burl instructed me to check for nails, spikes, or any metal that could present a hazard or dull the blade. Checking for metal is especially critical if the tree was located along a fence row or where signs may have been attached to the trunk. Some sawyers won't even mill trees taken from these locations.

A visual inspection may not reveal objects buried in the log, so many sawyers use metal detectors to search for hidden hazards. One Wood-Mizer owner tells a wild tale about hitting a horseshoe embedded in an oak tree's trunk, buried as the tree grew for years until it finally surrounded the metal.

After moving the log onto the mill's loading arms, the LT-40's hydraulics took over, picking up the



**1** With help from Burl, Assistant Editor Dave Stone rolls a log onto the mill's hydraulic loading arms. Logger's cant hooks, or peaveys, give much-needed leverage.

log and depositing it on the mill's skids. To get the best yield and the longest, flattest boards possible, Burl positioned the log to avoid cutting across any bends. I watched with awe as he deftly maneuvered this immensely heavy tree branch with slight flicks of the levers controlling the hydraulic turner.

### Making the Cant

There are several techniques for milling boards from a log. The simplest is flat-sawing — cutting slices without moving the log. This method results in the widest boards possible, but with edges covered with bark. To get straight, clean edges, you must first shape the log into a square beam called a cant, then flat-saw the boards from it. Shaping a cant wastes a bit more wood, though most of the waste is made up of less desirable sapwood.

Once he cut deep enough to reach the heartwood, Burl threw a few levers to flip the log a quarter turn (**Figure 2**). Then he cut an adjoining face square to the first (**Figure 3**), and so on until the four sides of the cant were square.

The cant made it easy to cut boards of consistent thickness with straight, parallel edges (**Figure 4**). In very short order the tree branch became eight straight-edged boards 1"-thick and just over 9"-wide.



**2** Burl cut away the sapwood on one log face then rolled it to square the adjoining face.



**3** With the second face cut, the square core (called a cant) begins to take shape.



**4** Once the cant is shaped, it's just a matter of making successive cuts to produce lumber of any desired thickness.





**5** The mill's thin blade wastes little wood. Water keeps the blade running cool and prevents pitch buildup.



**6** You can remove each board as it's cut, or leave them in place and slice the whole log before pulling the boards.

I noticed there wasn't much sawdust piling up on the ground. For this, the thin kerf of the band saw blade gets the credit (**Figure 5**). I estimated that the branch yielded two boards more than if I'd cut it on a thick-bladed circular saw mill.

Due to the mill's horizontal band saw configuration, you can remove each board as you complete the cut, or you can mill an entire log without removing the planks (**Figure 6**). Regardless of that choice, after completing each cut you raise the blade above the log, then back the carriage to the log's front end so you can lower the blade and make another pass.

By the final cut, I was amazed to see the sparse yield we got from that branch. It made me appreciate how many trees it's taken to provide wood for my projects over the years.

### Taking the Controls

After off-loading the boards from the branch, Burl and I rolled the straight section of trunk onto the loading arms. Then it was my turn to give this machine a try.

Burl had skillfully manipulated several levers at once when he loaded the branch, positioning the log easily with the turning claw, toe boards, and clamps. My effort with the trunk was a lot less graceful (downright clumsy in fact). But I soon had the log clamped in position and stood back to admire how easily this machine had moved a 20"-diameter log measuring over 8 ft. in length, guided by the hands of a rank amateur (see *Taking a Turn at the Sawmill's Controls*).

My hands were already sweating, and it only got worse when I grabbed the controls to make the first cut. I decided to flat-saw the trunk to get the widest boards possible. From the start, my adjustments of the band saw carriage were awkward, and I quickly found out that I had to learn how to walk along with the carriage while simultaneously governing the saw's feed rate and moving the blade guides to keep support close to the log (**Figure 7**). Burl made it sound as simple as walking and chewing gum at the same time. I prefer to

## Taking a Turn at the Sawmill's Controls

At first glance the Wood-Mizer LT40 Super Hydraulic looks like a complicated machine. It is complex, but its simple controls, hydraulic log positioners, and its strong engine make it amazingly easy to run. With no more than 15 minutes of coaching, I was confidently sawing logs into lumber. It's a machine that demands respect, but earns it as well.



Once you manually roll a log onto the loading arms, you can use the LT40's hydraulics to lift it onto the mill's skids.



By operating these levers you can load, turn, clamp, and level a log using hydraulic power instead of your back.



A hydraulic log turner rotates logs as long as 21-ft. and up to 3-ft. across. Hydraulic clamps secure the log.



The controls move with the saw carriage over the stationary log as you walk along controlling cutting depth and speed.



A large rule above the controls shows depth-of-cut in both inches and quarters — the thickness standard for hardwoods.



think that it's a lot like driving a car — there's a lot on your mind at the beginning, but it all becomes second nature with practice.

### The Moment of Truth

After sawing the first trunk section, and building confidence at the mill's controls, I turned my attention to the section containing the crotch. I would finally see if it concealed the wild figure I'd hoped for.

After each cut, I shut down the mill to look at the newly exposed wood. For the first few cuts, not much appeared. Then, on the fifth cut, I brushed off the dust and saw spectacular figure. I cut three 8/4 slabs that I might use to build table tops. Two more 4/4 pieces showed the same pattern before the wild figure petered out.

Now I know why this wood brings a premium price. In a crotch of at least 20"-diameter, I got only five slabs having this coveted wood figure.


### Good Wood from Waste

With surprising speed and little sweat on my part, this mill turned a tree destined for the firewood pile into enough board feet of lumber to build many projects. Of course, it will be a while before the wood is dry enough to use.

I coated the ends of each plank with latex paint to prevent them from drying too quickly and splitting. Then I stacked the lumber in my garage, spaced with thin wood strips called stickers to allow air to circulate. Air-drying wood can take up to one year per inch of thickness.

### You Can Do it Too

If you've got a large stand of trees to convert into lumber, a portable mill may be a good investment. You can own a Wood-Mizer LT15 mill for around \$4,500. It doesn't have all the hydraulics or the cutting capacity of the LT-40, but otherwise the setup is similar. Going all out for the LT40 will set you back about \$25,000. You'll find other Wood-Mizer models priced in between. Other nameplates you'll find on portable band saw mills include TimberKing and Lumbermate.

For the less ambitious, I recommend calling Wood-Mizer or TimberKing to get the names of sawyers in your area who can mill logs at your site. Rates vary by region, tree species, and accessibility. Once you have a sawyer on hand, treat him well — you may get to take a cut or two with your hands on the controls. 



You don't have to shape a log into a cant. On a trunk section, Dave flattened one edge of the log, then flipped it over and flat-sawed the rest to create wide, rough-edged boards.

### Sources

- Wood-Mizer (800) 553-0182
- TimberKing (800) 942-4406
- Lumbermate (800) 279-4441\*

\*available through The Woodworkers' Store



# New Tool Offerings

## Stanley's Hot New Glue Gun

For a long time, I didn't think much of hot melt glue guns. My first experiences with them convinced me that light-duty craft applications were all they could ever be good for. Serious sorts of projects required glues with longer set times and superior bonding capabilities.

The new Glue Pro glue gun from Stanley Fastening Systems (a division of The Stanley Works) is one reason I've begun to change my mind. This is a tool with lots of potential uses around the house and shop.

The Glue Pro comes with three types of glue sticks (six of each type). The All Purpose, Dual Temperature, and Super Strength glues are formulated for different uses ranging from

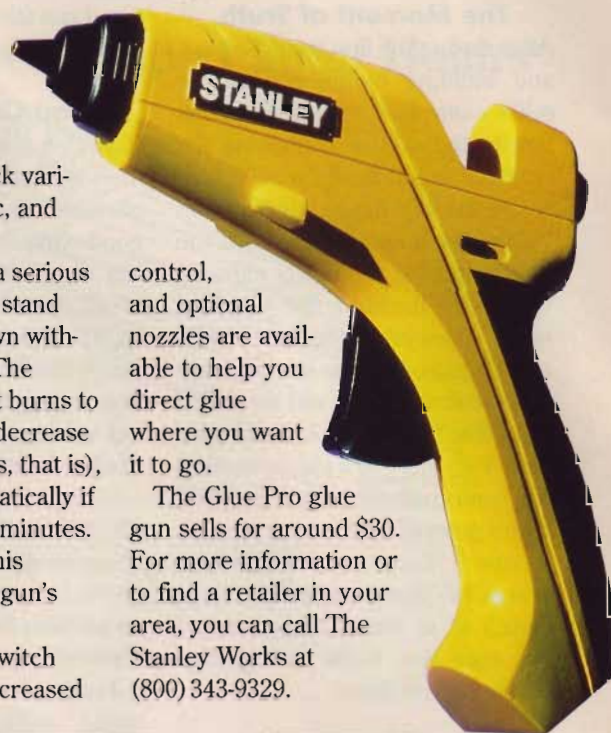
simple repairs to reattaching countertop laminates. Stanley offers more glue stick varieties for use on wood, plastic, and other materials.

The Glue Pro gun itself is a serious tool. Its integrated fold-down stand allows you to set the gun down without creating a mess of glue. The nozzle guard protects against burns to you and your workpiece. To decrease the risk of bigger burns (fires, that is), the Glue Pro shuts off automatically if left unused for more than 15 minutes. More than a safety feature, this increases the life span of the gun's heater element as well.

A high/low temperature switch (80 or 40 watts) gives you increased

control, and optional nozzles are available to help you direct glue where you want it to go.

The Glue Pro glue gun sells for around \$30. For more information or to find a retailer in your area, you can call The Stanley Works at (800) 343-9329.



## Saw Features Tool-Free Blade Changes, Two Handle Styles

Some people prefer using a jig saw with a handle on top (known as a D-handle-style), while others prefer the no-handled, barrel-style jig saws. Hitachi Power Tools (a division of Hitachi Koki U.S.A., Ltd.) has introduced a jig saw with a number of handy features, and it's available in a D-handle-style (model CJ110V) and barrel-style (model CJ110VA) to suit either preference.

The saw has a 120-volt, 5.2-amp motor. Cutting speed is electronically variable from 300 to 7200 strokes per minute. You can cut through wood up to 2 1/2"-thick and metal as thick as 3/8". Both are capable of orbital or vertical cutting.

Simplifying blade changes is the goal behind the saws' blade chuck. Without any tools, you can lock and release blades by hand — a nice feature, especially when working away from the shop.

Tilting the base for bevel cuts also requires no tools, just a turn of a

lever below the saw body. The base, made of cast aluminum to help keep weight down, has a steel insert for increased durability.

The saw comes with a clear plastic guard that surrounds the blade to stop flying splinters. You'll also find three blades in the kit.

Available accessories include a circle cutting guide, straight-edge guide, a dust collection adapter, and a plastic base to prevent marring your workpiece.

As of press time, retail prices for the saw had not been set. For more information call Hitachi Power Tools at (800) 546-1666.





## Bits Get a 10th Birthday Bash

Black & Decker is commemorating the 10th birthday of its Bullet Pilot Point Drill Bits by offering a set of 20 bits in a case for a suggested retail price of \$20. The set contains bits from 1/16"- through 1/2"-diameter, including two each of the six smallest bit sizes.

The construction of a Bullet bit is similar to that of a brad point bit. At the Bullet's tip is a sharp point designed to cut quickly into the material to keep the bit from wandering off its mark. The bit's main body has two deep flutes and cutting edges with a steep shear angle for an aggressive cutting action.

Black & Decker claims that Bullet bits, when compared to conventional twist bits, drill twice as fast in wood and four times faster in metal. I didn't do timed tests, but did drill accurate holes in wood quickly using these bits.

The set comes in a plastic case that has marked holes for each bit to stand in, and a clear cover. Call Black & Decker at (800) 544-6986.

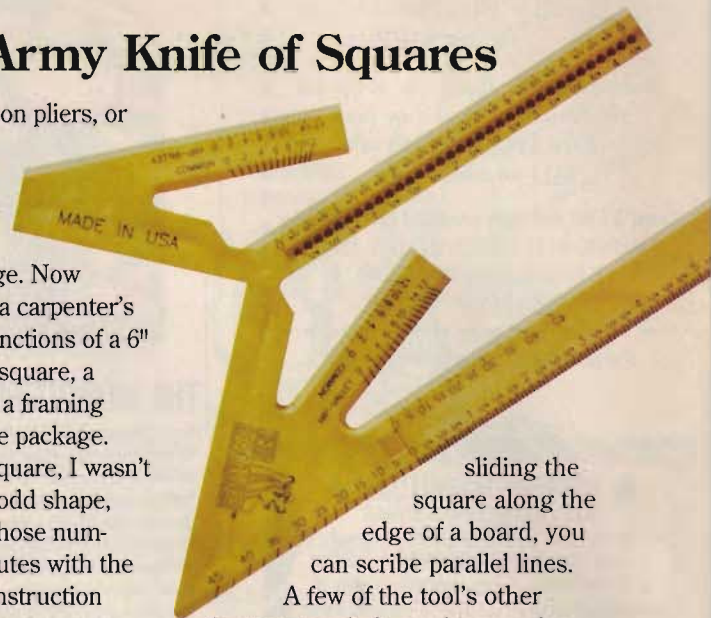


## The Swiss Army Knife of Squares

Tools such as multifunction pliers, or camping knives with more points than a porcupine, win fans because they combine many features into a single package. Now there's the Bear Square, a carpenter's tool that combines the functions of a 6" speed square, 12" speed square, a combination square, and a framing square into one space-age package.

When I first saw this square, I wasn't sure what to make of its odd shape, nor could I decipher all those numbers. But after a few minutes with the tool and its well-written instruction manual, I easily learned its functions.

A retractable tab on the 12"-long arm allows using the tool as a standard square or straight edge guide. The 6"-long arm has two scales, one for measurements, and another that aligns with holes spaced every 1/8". By placing a pencil in any hole and



sliding the square along the edge of a board, you can scribe parallel lines.

A few of the tool's other functions include marking angles, rafter and roof pitches, bird's-mouth cutouts, and ledger board notches.

Made of Lexan polycarbonate for durability, the square sells for \$28. Its pocket-size manual has charts with common carpentry calculations. Call Bear Square at (770) 857-8399.

## Ryobi Drills into DIY Market

Ryobi is now offering four new cordless drills targeted at people with occasional drilling needs and a modest budget. With suggested prices between \$49 and \$100, and a power range from 6- to 12-volts, these drills should give low-priced corded models a run for the money.

All four HP Series drills share a long list of features — a reversible motor, keyless chuck, 24-position clutch, a center T-handle design with a no-slip grip, and a carrying case.

The 12- and 9.6-volt models have variable speeds (0-550 rpm), and each comes with two battery packs and a three-hour charger. The 7.2-volt model has two drilling speeds (300/500 rpm) and a single battery, plus the charger.

The star of the show may be the 6-volt drill. At just \$49, it has the same clutch and keyless chuck features as the others, two speeds (300/500 rpm), and a built-in battery. It comes with a recharger and even includes a 28-piece accessory kit. For anyone wanting a basic household drill, this is hard to beat. Call Ryobi America Corp. at (800) 525-2579.





# Products For Your Home

## House Paints Formulated for Climate

On any given day, the temperatures and weather are not likely to be the same in Pittsburgh as they are in Phoenix or St. Louis. That's because each city lies in a different region of the country, and as a result may be subject to vastly different climatic conditions. Yet exterior paints have essentially the same formulas regardless of where they're sold. The same paint is expected to hold up to the dry heat of Phoenix as well it tolerates Pittsburgh's cold, rain, and snow.

Dutch Boy Paints saw this as a shortcoming and decided paints would perform better if each was formulated to meet the needs of a particular region. As a result, Dutch Boy scientists have divided the country into five

climate zones, and developed a Climate Guard latex paint for each one.

The five regions Dutch Boy settled on are Northwest, Northeast, Southeast, Sunbelt, and Heartland. For example, Northwest formula has extra solids to resist moisture and mildew and stand up to heavy rains. The Sunbelt formula is meant to withstand sunlight exposure that can cause paint to fade and crack.

Climate Guard paints are available in flat or semi-gloss. All are tintable to match any of Dutch Boy's colors. Or you can have the paint mixes made to match your home's existing color scheme. Each of the five formulas retails for around \$20 per gallon. Call Dutch Boy at (800) 828-5669.



## Lawn Machine Vacuums, Blows, Mulches

Lawn blower and vacuum combination machines can really speed up yard cleanup chores. But switching between blower and vacuum functions is sometimes complicated. Often, changing between functions requires switching tubes between the intake and exhaust ports and installing or removing the vacuum bag. In the worst cases this requires using tools. No big deal, but taking extra time defeats the whole purpose behind these machines.

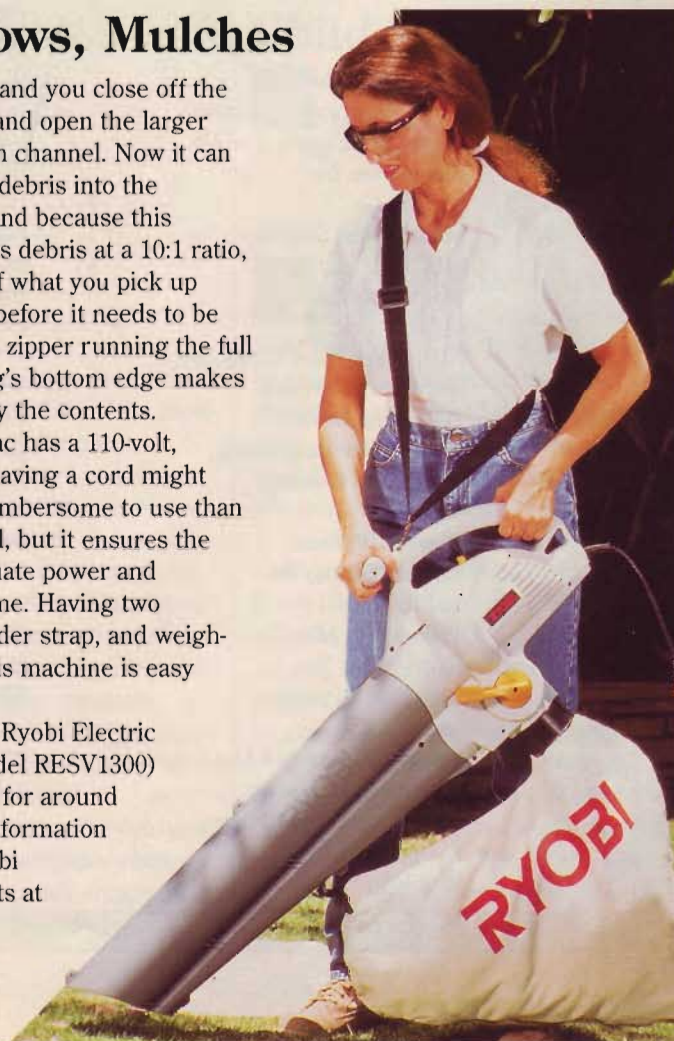
A new Electric Blower-Vac from Ryobi Outdoor Power Tools makes switching between functions a less complicated task. You don't have to change any parts or disassemble the machine. All you do is throw a large lever on the Ryobi's side to open or close one of the machine's two air channels — a large diameter channel for vacuuming, and a smaller one for blowing.

As a blower, the Ryobi pushes a stream of air through the small channel at 155 mph — enough power to push wet leaves and matted debris.

Flip the lever, and you close off the blower channel and open the larger diameter vacuum channel. Now it can suck leaves and debris into the collection bag. And because this machine mulches debris at a 10:1 ratio, it means more of what you pick up goes in the bag before it needs to be emptied. A large zipper running the full length of the bag's bottom edge makes it easier to empty the contents.

The Blower-Vac has a 110-volt, 12-amp motor. Having a cord might make it more cumbersome to use than a cordless model, but it ensures the motor has adequate power and unlimited run-time. Having two handles, a shoulder strap, and weighing only 9-lb., this machine is easy to carry.

You'll find the Ryobi Electric Blower-Vac (model RESV1300) in home centers for around \$90. For more information you can call Ryobi Outdoor Products at (800) 345-8746.





## Man-made Lattice Has Wood Look

I've always shied away from using plastic lattice on my projects because I was unimpressed with the way these products tried to look like wood. But after battling to cut and apply finish to real wood lattice on a fence I built last fall, I decided to take another look at plastic lattice before taking on another similar project. I was pleased to see some of the newer designs, such as Dimensions Weave

Lattice by Tuff-Bilt Products (a division of Plastics Research Corp.) imitate wood very convincingly.

Dimensions Weave panels measure 4 ft. x 8 ft., just like wood lattice, and can be cut to shape. Unlike wood lattice, though, the product's one-piece molded construction keeps it from coming apart while you cut. Zero maintenance is the other bonus — the durable high-density polyethylene (HDPE) plastic never

needs a protective finish like most wood panels do.

The lattice is available tinted to match outdoor woods such as cedar and redwood, and in a variety of other colors.

Dimensions Weave retails for around \$20 per 4-ft. x 8-ft. sheet. Contact Tuff-Bilt at (800) 394-6679.



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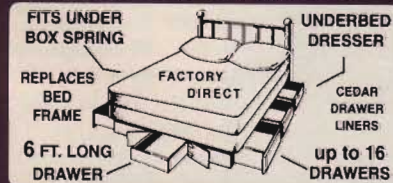
## On-Deck Storage Container

The Rubbermaid Deck Box is designed to solve a problem most people with deck furniture face — where to store cushions and outdoor accessories.

The box is 42" wide, 24" deep, and 24" high, and accommodates four thick cushions. Double-wall, molded plastic construction makes it sturdy enough to hold firewood. The Deck Box is available in several colors and sells for around \$70. Call Rubbermaid Inc. at (800) 643-3490.



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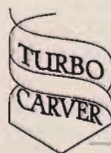


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## One Dressed Up Step Stool

The Penguin Platform Ladder may sport a strange name, but according to the manufacturer, Werner Ladder Co., it's loaded with features that make it superior to previous step stool designs. Foremost are the ladder's "feet," the



likely inspiration for the Penguin name. They stick out to the sides for extra stability, and have non-marring, slip-resistant soles. The ladder also has wide steps and a large platform designed for better stability, plus hinges that won't pinch your fingers when you fold in the legs. Aluminum legs keep the ladder lightweight but strong, and a removable tool caddy holds a gallon can of paint.

Two-step and three-step models are available for around \$60 and \$100, respectively. Call Werner Ladder Co. at (847) 455-9450.

## Wood-Framed Mirror Doors

Sliding closet doors with mirrors provide full-length views and can complement a room by creating the illusion of more space. But the door frames are sometimes plain, and they don't always mix well with existing woodwork.

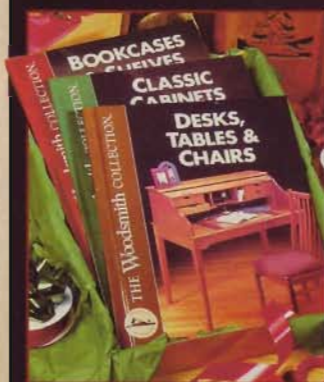
To answer the call, Stanley Home Decor has introduced a line of sliding mirrored doors with fancier features — real wood frames and beveled-glass mirrors.

Stanley's 425 Series has 2½"-wide frames in mahogany, cherry, knotty pine, and two oak finishes. The 440 Series frames are 4"-wide with cherry or mahogany finishes, and a V-groove detail in the mirror.

Prices vary from \$200-\$350 for the 425 series, and \$300-\$500 for the 440 series, depending on the wood and door size. Call Stanley Home Decor at (800) 345-1397.



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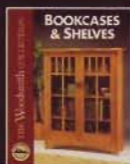
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## Painter's Light

Painting under poor lighting conditions makes it difficult to get complete, even coverage. But bright lights that create harsh shadows and glare make painting tougher still.

To help eliminate these problems, Regent Lighting Corp. introduced the Painter's Light. It uses a halogen bulb

behind a frosted lens to produce diffused light with less glare and softer shadows. The \$30 fixture has a two-position switch (150 or 300 watts), and it's designed to show true colors. Call Regent Lighting Corp. at (800) 334-6871.



## Power Goes Out, Light Turns On

The last time I needed a flashlight at home was during a power failure. Of course, the outage occurred after sunset, so just finding the flashlight was a challenge. Someone at Black & Decker may have had a similar experience, leading the company to develop its new VersaPak StormLight Home Emergency Light. This rechargeable flashlight sits in a base that doubles as a charger and can be mounted to the wall. When the electricity goes out, the light automatically turns on, so you can find it without fumbling in the dark.

The light comes equipped with one VersaPak battery that provides up to two hours of illumination on a full charge. For a longer run-time, the base can hold and charge two VersaPak batteries simultaneously. (You have to purchase the second battery separately.)

The StormLight uses a bright krypton bulb and has an adjustable bezel that allows you to broaden or sharpen the light's beam.

Retail cost is around \$36. To find out more, you can call Black & Decker at (800) 544-6986.



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# A Tale Of Two Saws

Walk onto a residential construction site in California and chances are you'll find the carpenter using a worm-drive circular saw. Visit a similar site on the East coast, and you can bet that a builder there will be using a helical-gear, sidewinder saw. In fact, you may even hear the two types of saws respectively referred to as West Coast and East Coast framer's saws.

While the lines of this regional preference have blurred a little over time, this tale of two saws began in the 1920's. Skil, which first developed the left-bladed worm-drive saw in 1924, was located in Chicago. Porter-Cable, then based in New York, introduced the first sidewinder in 1929 and put the blade on the right side to avoid patent infringement. Given the difficulties of national marketing and distribution in that era, each company concentrated on different markets — Skil in the growing west and Porter-Cable in the familiar east.

Simple geography and market distribution gave way to trade practice, however, especially when the GI Bill spawned the post-World War II construction boom. As contractors put up thousands of homes in America's suburbs, they trained apprentice carpenters with the tools they were accustomed to using. As the training cycle repeated itself in the decades that followed, this tool preference was passed along to succeeding generations of builders. Although Porter-Cable later introduced a left-bladed sidewinder to compete more directly with worm-drives, the Mississippi River still exists as the Mason-Dixon line of circular saws.

